Transitioning Between Worlds

Editing and Pre-production in Cinematic Virtual Reality

Master thesis

Aalto University of Art, Design and Architecture
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Abstract

As this work is written, the new wave of virtual reality is about to hit the mainstream. The idea of virtual reality has been visited and revisited many times, but this might be the first time that technology meets vision in a cost-effective way. The time just might be right for the next medium of storytelling.

This thesis explores the possibilities of virtual reality as a cinematic form of art. VR is a projected illusion of reality, and the viewer relies on the person doing the projection for accuracy. For this, just as in cinema, some ground rules need to be established. These rules become an agreement between the creators and the viewers, and are established as the medium is new.

Artists such as filmmakers need to be active now, in order to have a say in how the medium is shaped. The language of cinema is not directly applicable to cinematic VR, a new grammar needs to be crafted. In this work I ask what role the film editor can play in this process, and what the possibilities are for editing cinematic VR. I also explore cinematic virtual reality and try to define it's value as a new medium for storytelling.

I picked two theories through which to examine cinematic VR and editing, both from opposite sides of the medium. The first one is Janet H. Murrays "Three Aesthetics of the Medium" for the analysis of interactive and digital story experiences (Murray 1998). The second is editor Walter Murch's "Rule of Six" (Murch 1995), a categorisation of the priorities in making an edit, which I rearrange to suit cinematic VR.

I found that the editor needs to be involved in the process from the beginning, as the main focus of the editors work in cinematic VR shifts from post- to pre-production. I describe this work in a case, the pre-production of the cinematic VR film "Ego Cure" that is currently in production at Aalto School of Art, Design and Architecture.

Immersion and a certain degree of agency are the strongest priorities in crafting a cinematic experience in VR. The rules I explore are aimed at cultivating these aspects. As cinematic VR develops and grows to become an art form in it's own right in the future, these rules will have been made to be broken, and that is just as it should be. Further research needs to be made into the topic of the immersive qualities of of digital narrative, but when it comes to editing cinematic VR it is ultimately a question of trial and error and having the patience to learn from our mistakes.

Keywords cinematic, virtual reality, digital narratives, film

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Abstrakt

Då detta arbete publiceras gör sig världen redo för nästa våg av virtuell verklighet. Drömmen om en virtuellt skapad verklighet är inte ny, men den här gången kan den vara här för att stanna. För första gången korrelerar visionerna med de tekniska möjligheterna, och kostnaderna för massproduktion av hårdvaran börjar vara realistiska.

Detta arbete undersöker vilka möjligheter filmiskt berättande har i den virtuella verkligheten. VR är en digital illusion av verkligheten, och åskådaren som upplever den måste lita på måste kunna lita på illusionens skapare. För att det här ska vara möjligt måste vi, precis som vi gjort me traditionellt bildberättande i film, skapa en egen grammatik och regler för berättandet. Det här arbetet måste göras nu, då konstformen fortfarande är ny.

Konstnärer och filmskapare behöver aktiveras nu och tillsammans forma om filmens bildberättande för den virtuella verkligheten. I arbetet ställer jag frågan hur filmklippare kan vara en del av denna process, och vilka möjligheter för editering vi kommer att ha i filmisk virtuell verklighet. Arbetet undersöker också det möjliga värdet virtuell verklighet kan tillföra berättartraditionen.

För undersökningen har jag valt att spegla ämnet genom två teorier. Den första är Janet H. Murrays "Tre estetiska principer", en teori för analys av interaktivt och digitalt berättande (Murray 1998). Den andra är filmklipparen Walter Murch lista över sex regler att tillämpa i klipp (Murch 1995), som jag omordnar för att passa filmisk virtuell verklighet.

Min konklusion är att klipparen behöver engageras i ett tidigt skede av filmproduktionen, då det i VR sker ett skifte i tyngdpunkten av klipparens arbete från post- till för-produktion. Jag beskriver detta arbete genom ett exempel, "Ego Cure", en film som är i produktion på Aalto Högskolan för konst, design och arkitektur.

Inlevelse, immersion och en viss nivå av interaktivitet är prioriteter då vi skapar filmiska upplevelser för den virtuella verkligheten. De regler jag undersöker är för att förstärka de här. Då den filmiska virtuella verkligheten utvecklas och blir en konstform i sin egen rätt, är de här reglerna gjorda för att brytas. Framtida forskning med fokus på nytt digitalt berättande behövs, men sist och slutligen måste vi filmskapare närma oss ämnet med tålamod och viljan att lära oss av misstag.

Nykelord virtuell verklighet, film, digitalt narrativ, filmklipp

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1.0 Introduction

The year 2014 was announced as year zero of the new wave of virtual reality (Chocano 2014). By today, in 2016, most of us have at least heard something about it, and perhaps started to realize it will have an impact on our lives one way or another.

"It really is all so fresh, it makes your brain hurt", Patrick Milling Smith, co-founder of the Vrse.works studio said (Anderson 2016). This is all so new we are making everything up as we go. We're in that experimental stage, where creativity and the desire to tell stories define the language of the medium. And it's all happening at great speed.

As the new hardware developed for viewing virtual reality, or VR for short, is starting to hit the market, industry forecasts are buzzing with hype. It is predicted that the whole VR industry may be worth US$150 billion by 2020 (Anderson 2016). Companies want to move everything from education, real-estate and therapy, to gaming and all kinds of entertainment into the metaverse, it's the new frontier.

At this point in time filmmakers are starting to really discover this field that had previously been utilized mostly by computer scientists, graphic designers and media artists (Anderson 2016). Cinematic VR bears promise of being the next big medium for storytelling, some call it the "last medium" (Chocano 2014). The line between games and cinema is being blurred further and further, as filmmakers catch up with the progress the storytelling if games has been making in recent years. There is much to learn, and even more to discover.

But the dream of VR is by no means a new one, it goes back for decades or centuries depending on how we define it. Experiencing an alternate universe, a new point of view, has always been a dream of humanity, as well as a possible threat. New technology is both worshipped and feared. How we relate to VR today is not at all far from how literature was discussed in the novel "Don Quixote" centuries back (Cervantes 1605).

The question of fear of the new needs to be raised from the point of view of cinema as well. Will this be the final blow to traditional cinema? Will VR push movie theatre aside, and cinematic VR make traditional cinema outdated? Also, what is cinematic VR and what storytelling capacities can it promise? Does it really have what we can call

cinematic properties, or is it limited to gaming and entertainment? Can we be truly immersed or will we forever be waiting for more interaction?

The answer to this remains to be seen. But if we want to have a cinematic future in VR it is clear we need to be engaged with these questions now, crafting the grammar and the tools for building stories. We need to ask if we want to, and how we can, take on this new medium to tell our stories. We can and should dream big about the possibilities of VR, but for now creating valuable content should be a priority. It is the time for exploring and testing, trial and error. Anything goes and what flies flies. As The Verge put it: "If you can dream it, VR can make it". (Schnipper 2016)

In this work I want to look at VR from an editors perspective, and to look at the editor from a VR perspective. Even though it is artificially constructed, virtual reality is an organic experience. Your mind knows it's not real, but your body believes it is. Transporting another person emotionally is at the core of the editors work, so as we move into exploring this new medium it makes sense for us to be on the front lines.

2.0 Virtual Reality

The purpose of virtual reality is to create a lifelike environment that gives the viewer the illusion of being present. VR is a reality simulated by a computer that is viewed through a head-mounted display, HMD. An HMD is ultimately "headphones for your eyes" (Alger 2015), goggles that close you off from your surroundings and show you a 3D image. VR can be animated or filmed, but in both cases "true VR" is stereoscopic, three dimensional, 360 degrees.[1]

Most virtual reality environments are designed to be interacted with in some way. This means the viewer needs additional devices, which can be anything from a haptic full body suit to a controller such as a data-glove or simply a computer mouse. Some of the side effects are still a problem in viewing VR at this point of the technological advancement, recurring motion sickness being at the top of the list, these problems are high priority at many companies and will hopefully be solved during the coming years.

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[1] This commercial uses green screen to demonstrate what it looks like to be in, and interact with, virtual reality: https://www.youtube.com/watch?v=qYfNzhLXYGc&feature=youtu.be

There are other technologies related to VR, and often confused with it. Augmented reality, AR, being the most common one. AR is different from VR in that it is projected on top of the reality we see around us, without cutting us off from the world. The AR user sees the world as we do, but augmented and enhanced by visual information. An other medium often mistakenly called VR is 360° video. 360° video is what we typically see a lot of right now, it's what all the 360° cameras and rigs film and what GoPro is currently making. 360° video is filmed material but differs from VR in that it is not stereoscopic 3D.

2.1 *History of VR*

Depending on how we want to define what a virtual reality is, we can set different markers for when actual VR was conceived. If we move past the debate on imagination, telling stories by the camp fire, and literature as organic forms of a type of virtual reality, and in to the technical aspect of VR, we can settle on the year 1962. This is the year for the first VR patent made by Mort Heining (Robertson 2016). His "Sensorama"[2] was an arcade cabinet, that projected something we would today classify as 4D cinema: film with a 3D image, vibration and smells. Sadly for him, and his wife who still to this day is paying his debts, his "cinema of the future" didn't take off.

The next attempt at VR came as early as 1968. Ivan Sutherland's viewing system "Sword of Damocles"[3] causes some smiles today, not least for it's wondrous name that it earned by being so heavy it needed to be suspended from the ceiling (Gottschalk 2016). But the Sword of Damocles was the first ever HMD (Head Mounted Display) and interestingly looks like a not-too-distant relative of the VR headsets of date.

Just like today it was still the most lucrative uses of VR that drove the technology furthest. In the US military Thomas Furness was developing simulators for training fighter pilots, like the "Super Cockpit". But the artists were never far behind. An early pioneer of the interactive element of VR was the artist Myron Krueger who was working on a virtual environment that would respond to physical movement at the University of

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[2] Heining showing his Sensorama: https://www.youtube.com/watch?v=vSINEBZNCks

[3] Film footage of the Sword of Damocles in use: https://www.youtube.com/watch?v=NtwZXGprxag

Wisconsin. Krueger projected images over the viewer in a dark room, working with dreamlike illusion and artificial reality. His early work includes "Glow Flow" from 1969 and "Metaplay" from 1970, both are works where the digital projections interact with the viewer in the experience in a game like way (Kreuger 2008)[4].

Through the late 70's and early 80's the home computer and gaming consoles had their breakthrough, which of course affected the area of VR in several different ways. The game developer Atari had a financial upswing and appointed a team, which included pioneers like Tom Zimmerman (inventor of the "Data glove"), Scott Fisher, Jaron Lanier, and Brenda Laurel, who started working on their version of VR. The team was founded in 1982 by Dr. Alan Kay and operated only a couple of years before being shut down as a consequence of the Ataris crash. Nintendo on their part developed and released the "Nintendo Power Glove" in 1989 (Robertson, Zelenko 2016). These breakthroughs in interactional hardware are the base of the tools we see developed today.

The early 90's brought the next wave of interest in VR. A lot of different consumer versions of VR entered arcades, malls and cinemas. A company called VPL developed a full body suit and W industries from the UK produced arcade headsets that for the first time brought VR to the mainstream (Robertson 2016). During this time VR started getting significant media coverage, focusing of course on the same sensational aspects we see in the press today; namely virtual sex and the danger of kids losing themselves in this new technology (Robertson, Zelenko 2016).

Even if the head-mounted displays of the time, or the content viewable in them, again weren't quite there to spark the imagination of the mainstream yet, the early adapters like artists took to them, and stuck with it as others left off. "When the zeitgeist is moving, art usually goes hand-in-hand with it" (Gottschalk 2016) as Rachel Rossin, the New Museum's first-ever virtual reality fellow said about early VR. Some of the work from this time includes Char Davis poetic work "Osmose" from 1995[5]. Davis used the idea of buoyancy to control movements in the VR space. The viewer would breath in and out for upwards and downward movement, or lean into the direction they wanted to move. Many people were moved to tears by the experience. She used the same technique

[4] Kreuger showing his work: https://www.youtube.com/watch?v=dmmxVA5xhuo

[5] Watch Osmose in action: https://www.youtube.com/watch?v=54O4VP3tCoY

on “Ephémère” in 1998[6]. With her work she hoped to shift the focus of the experience “from one of doing to one of being”, and take it in a different direction than the first person shooter games that other developers were focusing on (Robertson, Zelenko 2016). Davis is still working with VR today, for the last five years she has been working on an virtual thousand acre forest. When asked if she thinks that this time around will be different for VR she replies with another question: “can artists overcome the inherent biases of the technology, and the profit-driven imperative of the gigantic corporations gathering behind it, to create meaningful, relevant work? Time will tell.” (Gottschalk 2016).

The 90’s VR bubble was nearly as enthusiastic as the one we see today, but the technology and data power just wasn’t there yet for VR to make a lasting impact and for it to become an actual consumer product (Robertson, Zelenko 2016). By the mid-nineties the bubble started to burst, the hype had been bigger than the actual possibilities. Around this time the mainstream press shifted their focus over to the next New Big Thing: the internet. From then on the technology of VR continued to develop, mainly by the military and entrepreneurs, but the projects were mostly off the popular radar. The research from this time on would however eventually bring on Palmer Lucky’s Oculus Rift and the VR resurrection we see today.

So the birth of VR has been well documented and consistent, but resurfacing only briefly as a blip on the radar of the collective mainstream every ten years or so. What has changed to make this time different? This might be the first time when technology meets vision in an affordable way. “Now,” suggests MIT Media Lab’s Mike Lazer-Walker, finally “the hype just scratches the surface of what’s possible” (Gottschalk 2016).

In 2012 Palmer Luckey combined the ideas of the developers before him in a headset, The Oculus Rift, and collected $2.4 million on Kickstarter, in a campaign that was set to collect $250,000. The then only 18 year old Lucky had been working as an intern with some of the VR developers at the time, for example with documentary filmmaker and VR pioneer Nonny de la Peña, and had in the midst of this cutting edge content development at the same time been experimenting with old VR sets in his basement. The massive popularity on Kickstarter signaled that the time was right for another resurfacing of VR in the collective mind, and in 2014 Facebook bought Oculus from

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[6] Watch Ephemere here: https://www.youtube.com/watch?v=XCWaMll0leI

Palmer for $2 billion, changing the game completely. Suddenly VR was seen as profitable again, something that benefits everyone working with the medium today. As Eugene Chung, founder and CEO of virtual reality startup Penrose Studios and former head of film and media at Oculus said "What I thought was going to take 10 years to develop is only going to take one." (Gottschalk 2016)

Oculus is far from the only headset benefiting from this new wave of VR. As the Oculus Rift went on sale March 28th 2016, the HTC Vive followed close behind April 5th. Playstation VR is scheduled for this fall and in the meantime Microsoft is developing the Hololens, Samsung has their Gear VR, and the list goes on with new additions joining in frequently. Same goes for camera developers. As I am writing this, Facebook just launched their own open source camera to a market already buzzing with Nokias Ozo, Googles Jump and GoPros rigs just to name a few. With this many cameras and viewing devices hitting the market, I see a possible risk that the content will become scattered between platforms. If VR is to have a future, the content needs to be viewable with any of the devices and not platform-specific. Accessibility is key for VRs survival. It needs to be there for people to try, and it's content that is what will make people interested (Orland 2016).

2.2 VR today

VR is already a part of our lives whether we know it or not, and has been on different levels for a long time already. Surgeons and pilots train in simulators, vehicles are designed and tested in simulated virtual realities and military training has been using VR tools for dangerous operations for decades (Newton 2016). To most people the recent images of happy nerds immersed in VR headsets is still funny and alien, but there is no denying that the mainstreaming of VR has finally begun properly. The market for headsets is booming, according to one forecast it will reach two million units shipped in 2016 and reach ten times that by 2018, this could mean the whole VR industry may be worth US$150 billion by 2020. (Anderson 2016).

"I've never seen anything move so fast in my career – it's faster than mobile, faster than Web 2.0, faster than interactive video." says Michael Naimark, media artist and researcher (Anderson 2016). But many warn that this initial hype will quickly turn

harmful for VR. VR veteran Janet Murray expresses her worry "The problem is these polymorphous expectations, you can do anything, you are really there, that are going to make people give up on the medium" (Fusion 2016) meaning that viewers, content creators and financiers alike will disappear from the field too quickly when the hype settles. Filmmaker Werner Herzog has a similar worry "In this case, we do have a technology, but we don't have any clear idea how to fill it with content." (House 2016)

With VR being on everyone's lips at the moment there are countless projects being launched, and a lot of money going around. As always when something in the technology industry is surrounded by such hype and cash, the commercial value of VR is the one that gets developed with greatest speed. What people typically think of when VR is talked about today is gaming. This is not a surprise, since the consumer VR of the 90's and of today was mainly focused on gaming. "We start with games because game developers know what it takes to bring VR to market." explained Shuhei Yoshida, president of Worldwide Studios for Sony Computer Entertainment (Hamburger 2016)

VR video and cinematic VRs early adapters have mostly been the commercial ones too, closely followed by artists and documentary filmmakers. It didn't surprise anyone that the quickest to produce content was the porn industry, since the prediction is it will develop into a billion dollar industry by 2025 (Booton 2015). Real estate agents, retailers and the like also quickly realized the potential of VR video, imagining how much it will cut in costs not having to have the client physically present where the product is being sold. The commercial value of VR is undeniable, and it has been a main factor in how quickly the current technology has been developed.

The commercial focus on VR is not only a bad thing, the technology leaps will profit all areas of VR content producers. As long as we keep in mind that there is not going to be a single version of VR but multiple types, exactly what kinds only time will tell. Jaron Lanier expressed it well "It's going to be like everybody talks about a computer; the term computer doesn't exactly mean anything anymore. Instead we talk about having a phone, or a tablet, or a cloud service." (Newton 2016)

2.2.1 Value and uses

The values of VR lie far beyond being just a game machine or a virtual shopping mall. One of the versions of VR that is often brought up as an area of softer values and benefits for all is education. Attending free classes from top universities like Harvard or MIT on edx or mooc type platforms in virtual reality is really not that far off in the future. As mentioned before, simulations have been used by specialized education for long while already. With consumer VR becoming more accessible, the future class room might look very different with class trips, history lessons and even gym classes played out in a collective VR experience.

Another collective potential to tap into is the social networking aspect. It's not by chance that Facebook chose to buy the Oculus Rift. Hanging out with your friends in Second Life type avatar settings is not only science fiction anymore. The potential for office software, and for creative software, is also huge. Adobe just released their latest update for the editing software Premiere Pro that contains VR tools like equirectangular editing. We are of course several updates away from it, but the future could very possibly bring an editing software inside actual VR. At any rate, for VR to go from novelty to necessity it needs to develop these less entertaining aspects too. When your boss tells you to use VR software, thats when it's surely here to stay. "What VR needs now is to be needed" (Grossman 2016).

The potential for viewing art, and creating art specific for VR is unlimited. We can enjoy sculptures scanned into 3D space, installations, abstract art or just step into an exciting museum to watch the great classics without the bother of travel. As educational as it sounds to visit far away galleries and museums, the biggest potential lies in the creation of content specific for the medium. One of the aspects that can democratize the VR of the future, is if VR becomes more accessible and perhaps even everyday for artists around the world. The worlds we can explore through VR as an artistic medium are endless and still unimaginable. Jon Rafman, an artist already making working with VR went even further saying that for the modern human living in the sensory overload of today, VR might even be a necessary step to achieve a "fully arresting experience" and get a "total sense of vertigo from a work of art" (Gottschalk 2016)

Two other areas of VR that we see developing content quickly are journalism and documentary film. Both genres are a good fit for VR. Making the content of these fields available for consumers is already well on it's way. For example The New York Times recently distributed cardboard viewers to their subscribers, and a chance to watch their own content they are creating with Vrse.works (Anderson 2016). One of the films available is "The Displaced", a portrait of three refugee children created in collaboration with Unicef. Chris Milk from Vrse calls VR "The Ultimate Empathy Machine" (Milk 2015) and talks exaltedly about VR being the only medium able to truly connect human beings, "That's where the true power of virtual reality lies in regards to journalism" he says (Dodge 2015). According to Milk the connection is born because VR takes out "the middle man" and makes you feel as if you are actually present in the situation (Dodge 2015).

Another content maker pioneering the journalistic and documentary side of VR who emphasizes the power of being present in a situation is Nonny de la Peña. As it happens she is not only making content, but has also launched a company with her brother to develop a headset, the "zizag". On criticism that she should choose either hardware or content she replies "we're a content business, but ... when there's a hardware problem, we just solve it for now." (Volpe 2015). Her company is one of the ones Palmer Lucky worked on as an intern as he was developing the Oculus Rift. De la Peñas first VR documentary "Hunger in LA" premiered at the Sundance Film Festival 2012, and back then her fellow journalists criticized her harshly for VR being way too subjective. De la Peña now blames that early anxiety on the transformation that was going on at that time in traditional journalism. The digital was threatening the analog, and this new strange layer of virtual reality was just too much. For her there is no going back anymore, VR is how she works. "Print stuff didn't scratch the itch. Documentary didn't scratch the itch. TV drama didn't scratch the itch. [VR] can make people feel in a way that nothing, no other platform I've ever worked in can successfully do in this way." (Volpe 2015)

The first value of VR documentary content lies in simply placing the camera in an environment and letting the viewer experience it. This method has been used to great success already, telling stories from refugee camps and mountain tops. For now just "being there" is sufficient content, but as we as viewers gradually get used to scripted layers of primary and secondary action in our VR there is a demand for a new cinematic aspect to VR to develop.

3.0 Cinematic VR

Cinematic VR is essentially filmed 360 degrees video, stereoscopic 3D, viewed in virtual reality. It is an immersive virtual reality with none or very little interaction. While it's not a game environment to walk around in where you solve tasks, it would be ignoring VR's strengths to completely exclude interaction. The lines are not drawn and no rules should be made yet to say just how much interaction cinematic VR can have before it turns to gaming, this is still specific to each piece and creator. Also, since VR is more an experiencing than a viewing, it might just be impossible to exclude all levels of interaction.

There are many forms that interactivity can take in VR before the cinematic turns to game. Walking that fine line as much as possible should be considered a strength in the storytelling capacity of VR, but it is also a challenge. It is possible that too much interaction breaks the immersion and the illusion we are hoping for in a cinematic language. If you give people too much ability to interact with things, it's often harder to tell a story (Robertson, 2016). But including some fine tuned interactivity, with a clear purpose for the story, has the possibility to strengthen the narrative considerably.

Using eye-trace and head movements to trigger certain actions, when we can be sure that the viewer is looking in the right direction, is a perfect example of this. In the VR space we have the technology to read micro-behaviours like eye movements, and head tilts can be closely monitored. So even without going so far as to give the viewer the chance to interact directly with the virtual environment, we can make the environment interact with the viewer. If we want to make interactive cinema, VR is a beautiful platform to do so. The dialogue between the viewers reactions and the fiction unfolding can be taken to a completely new and minuscule level. As Ana Serrano says "The bubble knows what you want, before you know what you want" (Serrano, 2014), and you don't even need to know that it does. At this stage of the VR development there are still a lot of tests imitating the language of traditional cinema within the VR medium, but hopes are that the future will raise cinematic VR into an art form in its own right. Whether or not this will mean more interactivity or less, remains to be seen.

Compared to VR video, cinematic VR should take one step further and have some more of both narrative and esthetic cinematic qualities. Simply placing the camera rig

somewhere for a POV experience won't be enough for long, as filmmaker Andrew MacDonald's put it "There's only so much of that you can take." (Anderson 2016). What he hopes to see is more efforts to integrate and translate the cinematic vocabulary into the VR world. It is also true that many cinematic qualities can not be transferred into VR and it is certainly not a one-to-one fit (Brillhart 2016). The foundations of the cinematic language; how the camera moves with the scene, what lenses are being used and how the the reality is framed, and the cut between these frames, is what creates the emotional continuum that cannot be replicated in a 360 environment (Kirwin, 2014). But as digital media theorist and author of "Hamlet on the Holodeck" Janet Murray emphasized, cinema has had a very long time to develop a truly mature and sophisticated visual vocabulary and it could and should take VR just as long (Anderson 2016). The problem, she says, is that the hype surrounding VR at the moment is not only demanding results too fast, it is also attracting makers with short attention spans: "It's not like making a new toaster. It's inventing a new medium and you don't do that in four months or six months or two years."(Anderson 2016).

So for cinematic VR to be able to develop we need to give it time. This is both for the development of the technical medium, and the development of the viewer. Janet Murray explained "We need time to get used to an increase in representational power. During this time we test powers of the limits of the world" (Murray 1997, p103).

We need to figure out what could be the equivalent to changing the lens, cutting the image and sound and acting in parts, line by line, scene by scene, for the camera. But we also needs to step away from traditional cinema and enter into unexplored territory (Gottschalk 2016). There's a real opportunity to develop a wholly new aesthetic experience, unique to our time. "Art tries to take reality and fix it in an object, but reality itself is in flux," says digital artist Jon Rafman "I think it's the new medium, we've just got to figure it out"(Gottschalk 2016).

3.1 Immersion and the cinematic language

One way to approach the new cinematic language is through exploring how the experience of the virtual reality immersion differs from the immersion we experience in traditional cinema. VR challenges the traditional role of the spectator both by giving a

new degree of control and engaging them in interaction, but also by the physicality that being in a space brings to the experience. Oculus Story Studio's Sascha Unseld said "In a film you understand a character through their actions. And in VR, I think you understand the story more through what you feel in a situation." (Anderson 2016). This difference is not to be taken lightly. After watching VR there are many that report, like Shuhei Yoshida, president of Worldwide Studios for Sony Computer Entertainment, that the experience leaves a different memory trace than cinema: while a film leaves a memory of seeing something, VR leaves a memory similar to actually having been somewhere. "After a few days, looking back on that experience is interesting because it's kind of raw in my memory — as if I was actually in the sea." Yoshida said about his experience of "The Deep" (Hamburger 2016).

Strangely enough this almost physical presence in the experience is also what can stand between the viewer and the immersion. Being so aware of your own presence makes it harder to give control over to the film, and control is what VR needs to work. "It's very immersive, but you really need to commit to the experience" as NetherRealm Studios founder Ed Boon said (Orland 2016). Actually VR could learn a lot from theater in this sense, since it's a more open form of story telling. Theatre as an art form has been contending with many of the same issues, of how to relate to the fourth wall and how to effectively draw the attentions of the audience to details, for centuries (Anderson 2016).

Katy Newton and Karin Soukup asked: "How do we tell a story for the audience when the audience is present within it?" (Newton, Soukup 2016). Newton and Soukup address what they call "being bodily present" in VR and explore the VR experience through an "AX", audience experience, point of view. They came to the conclusion that, especially in VR, there is no such thing as a neutral observer. They found that audiences had a strong urge to define their role and the reason for their presence, in the scene they were watching. If no clues were given, the viewer had the same urge and turned to expressions like "a fly on the wall". What this leads to is the construction of a body, and in extension of "being". Newton and Soukup emphasize that storytellers in VR need to remember this urge and to give the viewer enough context to feel comfortable. Also, even if cinematic VR doesn't employ interaction, looking is doing, and as the audience can choose where to look they always have some form of agency (Newton, Soukup 2016).

Computer scientist Jaron Lanier who was involved in the evolution of VR in the late 80's expressed his interest in VR being mostly about this specific quality, feeling your own existence. He elaborated by saying that to him it was proof that "subjectivity is real; that consciousness is real, that it's not just a construct that we put on things. Just to notice that you really exist, to me, was the very, very core of it" (Newton, 2016).

3.2 Janet Murray's theory of Immersion / Agency / Transformation

Digital storytelling as a subject has been explored and researched for decades. Sometimes the generation of digital natives that now take to preaching the gospel of VR easily forget that they have shoulders to stand on, and try to reinvent the wheel. Next, I want to include two premillennial theories, and use them as a lens to investigate cinematic VR. The first is by digital theorist Janet Murray, and the second by editor and writer Walter Murch.

In her 1998 book "Hamlet on the Holodeck: The Future of Narrative in Cyberspace" Janet H. Murray proposes three aesthetic categories that she calls the "Three Aesthetics of the Medium", for the analysis of interactive story experiences. These three are; immersion, agency, and transformation (Murray, 1998). The categories describe what it feels like to participate in a digital story and can be applied to all digital storytelling, especially to VR.

3.2.1 Immersion in Cinematic VR

Immersion is a metaphorical term, derived from the physical experience of being submerged in something. We want the feeling of being submerged in another reality like in water, surrounded completely by it. But, Murray argues, "in a digital and participatory environment this submersion is more like learning to swim" (Murray 1998). She suggests three ways of guiding the viewer to immersion: structuring participation as a visit, structuring participation with a mask meaning for example an avatar, and making the technical interaction seamless (Mateas 2004).

About her first method, the visit, Murray argues that since immersion is not only the feeling of being present in another place, but also being engaged in the action that unfolds, the storyteller needs to establish with the viewer why they are where they are. She also argues similarly to Newton an Soukups that there is a need to establish a fourth wall "if we are to enter the fictional world without disrupting it" (Murray 1997, p103). In a game the experience is often linked to some kind of task, which is a clear reason of being there. In cinematic VR it is more tricky to address this, traditional cinema more seldom gives the viewer more reason to watch the film, either than the simple pleasure of watching it. This is reminiscent of Newton and Soukups "Seeing is being" (Newton, Soukup 2016), and perhaps the same principal can be applied to cinematic VR. "Seeing is being" is especially applicable to the documentary genre where the viewer is bearing witness to the situation unfolding.

Her second suggested method is the mask, or "avatar". There has been several experiments giving the viewer a body to look down on in cinematic VR, but so far none of the ones I've experienced have been on the right side of the "uncanny valley". The porn industry was of course very quick to the use of the mask in their experiments with VR, they attach the 360 camera rig to the head of the male actor in order to give an immersive experience. This is problematic as it it brings a whole new dimension to the concept of "the male gaze".

The third way that Murray proposes of helping the viewer towards immersion is through making the experience as seamless as possible. This is one of the things that has held VR back in the past, but that is being remedied as I am writing this. The hardware is being developed rapidly, and the cameras are developed alongside it. When we get the stitching of the material consistent, and the frame rate up to speed (90fps is optimal for the Oculus Rift), we can focus more on the culture of consuming VR. Some questions we need to explore are if it should be done in a group like in a cinema, or in the privacy of our home. We need to find out how to get to a place where we are comfortable with covering our senses without feeling too vulnerable.

Immersion, of course, is possible with any expressive art-form, given the nature of human imagination. But as filmmakers we want to guide this immersion in a way that follows the emotions and story that we are there to tell, to help it along. The rules of cinema act like a guide, and similar rules need to be found for cinematic VR. In the end

it comes down to what Murray calls “active creation of belief” (Murray 1997, p110), related to Coleridge’s “willing suspension of disbelief”, when the viewer is willing to accept the internal logic of the experience (Mateas 2004). This is crucial for VR, since the experience requires the viewer to actually strap something to their face and totally commit their senses to it. If the entry into VR is not made willingly, no true immersion is possible.

3.2.2 Agency in Cinematic VR

Murray favours interaction as an element that leads to immersion. She writes “the advantage of participatory environments in creating immersion is their capacity to elicit behavior that elicit the imaginary objects with life” (Murray 1997, p112). In other words, they stimulate the use of imagination, and through that, the willingness to immerse.

But agency is more than interaction, and activity alone is not agency (Murray 1997, p128). Murray defines agency as “the satisfying power to take meaningful action and see the results of our decisions and choices” (Murray 1997, p126). While interaction could merely be the chance to click at things with your mouse and see them wiggle or something similarly simple, agency needs to have more purpose and and be related to the viewers or players intention (Mateas 2004).

Agency and it’s different forms should be at the center of cinematic VR. Filmmaker Jessica Brillhart wrote that the viewer is the storyteller in VR, and that we can only try to make a path for them to follow (Brillhart 2016). She was speaking of editing, but it applies to cinematic VR in a larger scope. The active choice of engaging in a narrative in VR is a very strong form of agency. Choosing where we look is shaping the story through our subjective experience.

Spatial narration and moving through virtual landscapes is a form of agency Murray mentions that is directly applicable to VR. She says it is characteristic for a digital environment and can be pleasurable in itself. (Murray 1997, p129). It might be more than enough for the audience to sit back and let the virtual world unfold around them, but it will be interesting to see when and how someone will include the omnidirectional

treadmill into a cinematic VR experience, letting the viewer walk around invisibly where they want in the world of the film.

As we as filmmakers take on this new medium for our work, agency is paramount to how we develop our stories. In order to not only translate film into VR, but to create something new, we need to embrace the potentially scary uncertainty that we no longer have a frame to control what the viewer sees. The chance to tap into the potential of agency is what VR gives us in return for this uncertainty, and we should use it mindfully.

As Murray said, "because we experience ourselves as present in these immersive worlds, we want to do more than merely travel through them" (Murray 1997, p109). This is because VR makes us feel as if we were on the stage rather than the audience. The more immersive the environment, the more active we feel within it. (Murray 1997, p126)

3.2.3 Transformation in Cinematic VR

Transformation is perhaps the one of Murrays three aesthetic principles least applicable to cinematic VR. In games the transformation could mean an actual transformation of the avatar as the story progresses (a level up so to speak) and a transformation of the rules of the game itself (Mateas 2004). In cinematic VR the transformative quality of a true experience can perhaps be read in the lines of a personal transformation. As the narrative ends, and you take the headset off, some sort of transformation has occurred and you can view your own reality in a different way.

4.0 Editing cinematic virtual reality

Many have speculated that editing in VR might prove to be impossible. In virtual reality you are the camera, so an edit is more like a teleport than a blink. It can be very jarring (Page 2015) . This is because while traditional editing is frame to frame, VR is more like world to world (Fusion 2016). So where does the editor fit in on all of this? Will editing in VR be reduced to simply jumping between worlds, transitioning from one scene to the next as if a stage hand at a theatre play?

J. Lee Williams of Occupied VR said "The best directors for VR aren't going to be the biggest directors in Hollywood – they'll be the ones who understand the human mind and psyche." (Anderson, 2016). I would like to alter that a bit and state that the best directors will be the teams containing writers and editors. The unique understanding of rhythm and immersion that comes from working with film editing is something valuable as we construct the language of VR. I don't think the editor by any means will become obsolete, but the focus of the work will shift from post-production to pre-production.

Newton and Soukup wrote that the storyteller needs to shift away from the role of "director" to "influencer" (Newton and Sokup 2016). Where the film director is burdened by directing and the cinematographer is burdened by the frame, the editor is more free and has been practicing influence on the viewers since the birth of cinema. Testing the emotion and constructing a reality is what we do. Brillhart also speaks of the weight we carry in form of the frame and the idea that we have to "force" the viewer to look at a certain point. She says that if this is your impulse, you are fundamentally wrong for VR (Brillhart 2016).

Newton and Soukup liken the storyteller to a matador, "waving the red cape in the direction they want the audience to run, knowing that the power ultimately lies in the audiences hands to see what they want to see, hear what they want to hear and form their own stories about what they have experienced" (Newton and Sokup 2016). Chris Milk of vrse.works also favors new terminology for the virtual reality storyteller, he uses the way more pompous "creator". He specifies "In virtual reality, it's more about capturing and creating worlds that people are inhabiting. You really are a creator in the way the audience lives within the world that you are building." (Dodge 2015).

For me, a lot of the conversation today is underestimating the viewer. If the story being told benefits from editing, audiences will get used to it eventually. Cinema has developed through several stages already, from introducing sound to color to CGI and 3D. Through every change the creators have proceeded with caution, editing more slowly to give the viewers time to adjust to all the new types of information they are getting. It seems almost funny to us now that the first color films like "Wizard of Oz" struggled with pace because of these issues. We need to keep this in mind so we don't underestimate our audience of the future.

The human senses adapt to new things with unstoppable speed. The first reactions to VR are always fun to watch, people duck, swivel, and look like exclamation marks, but given just a few days they adjust and get jaded. As we have been testing things through our work with the film "Ego Cure" (see chapter 5.0), I have experienced first hand that what has seemed impossible to grasp on Monday can become boring by Thursday. Because of this we need to keep in mind that we are designing experiences for a wide range of people, ultimately the viewer will be looking past the medium and what they will see at that point is the content.

4.1 Three levels of editing in VR

Before we continue on to the film editing theories of Walter Murch, I want to differentiate the three kinds of edits I have found in cinematic VR through my own experience. The first one is unavoidable, the second experimental, and the third advisable.

1. *Editing between worlds*

This is the edit you can't get rid of, it is the transition between scenes and between locations. The transition is a one in time, and ultimately between worlds. The purpose of this edit is merely to transport us, and needs to be as smooth as possible.

2. *Editing within the world*

This is the edit where it starts to get interesting. Editing within the world implies constructing a tension and emotion by juxtaposing different camera angles and different worlds. This is the part that many still are sceptical about, but where I see great potential. This is the edit I will mainly talk about in the next part about Walter Murch's "Rule of Six".

3. *Editing in preproduction*

Careful planning before a shoot is crucial in VR because postproduction can't save as much as in traditional cinema. Editing in preproduction means planning and plotting the story and the scene and guiding the viewer through the narrative with an invisible hand instead of the change of perspective forced on by an edit. This work is almost like

that of the theater director, or dance choreographer. The VR editor is ultimately a dramaturg, an important aspect of traditional editing too.

4.2 Walter Murch's “Rule of six” theory

Without locking ourselves too much to tradition, there is much to learn from what audiences have come to expect from the cinematic language as we try to construct this new one (Highton 2015). So let’s look at the VR edit trough what we traditionally know about editing. I use Walter Murch's “Rule of six” (Murch 1995) as a point of reference when I study specific singular edits in traditional cinema, and it could be useful to see how the rules apply to virtual reality material.

The six rules that Murch establishes in “In the Blink of an Eye” (Murch 1995) are for keeping the viewer engaged through the transit of an edit. He organizes them by importance in the following way:

1) Emotion 51%

2) Story 23%

3) Rhythm 10%

4) Eye-trace 7%

5) Two-dimensional plane of screen 5%

6) Three-dimensional space of action 4%

All of the above seem to be just as applicable to editing in virtual reality, let's look at how.

1) Emotion

In cinematic VR emotion is still a top of the list priority. I don't see any way we can create immersive content without following up on emotion and giving the viewer a full arch in the emotional content. Following the emotion of the previous shot over the edit, or creating an emotion through juxtaposition is just as possible in virtual reality as in traditional cinematic storytelling. Since we are building worlds, not scenes, the emotion of the narrative needs to infuse these in order for the viewer to want to stay and follow the story.

2) Story

Content is king. As we struggle with the technical aspects of cinematic VR, it is important to keep our focus on the fact that it is a storytelling device. The viewer is crucial in the storytelling process of VR, wanting to follow the story is key to a successful cinematic VR experience. As Brillhart said "The story has to work a lot harder than it's ever had to work". It is our job, she continues, to make the story work harder (Bye 2016). As we edit, bringing the story to life is an undisputed priority. However, how we get the viewer to follow the story through the edit is much more dependent on the aspects of the rules at the bottom of Murch's list, but I'll get to that in a bit.

3) Rhythm

Here is where it get's just a little tricky. Depending on the three last rules we'll get to below it might be much harder to establish a rhythm. In VR we need to take into account the head movements and eye-trace of the viewer much more than in traditional cinema. If we have a person turning their head left and right all the time, even the slowest pace of editing can become too fast. But this works both ways, if we can use points of interest to get the viewer to turn quickly this can be used to emphasize rhythm. We need to be more mindful of rhythm as we edit virtual reality, and I would venture to bump up the original percentage that Murch attached to it's importance.

4) Eye-trace

Eye-trace, the concern with the location and movement of the audiences focus within the frame, is crucial in editing VR. With 360 degrees of potential canvas to watch, we need to be especially mindful of points of interest that can guide eye-trace. All of the first three of Murch's rules, rhythm, story and emotion, will suffer if the viewer constantly needs to look around and find where the story is being told.
Jessica Brillhart has an interesting theory about how to guide the viewer through a cinematic virtual reality experience using points of interest and eye-trace. She calls it "unlocking the hero's journey" (Brillhart 2016). The idea is to turn the 360° sphere around the viewer to match the points of interest from the end of the last and the beginning of the next scene. Basically how editors traditionally use eye-trace, but by turning the whole world. Her image of it is the story unfolding like rings on an onion:

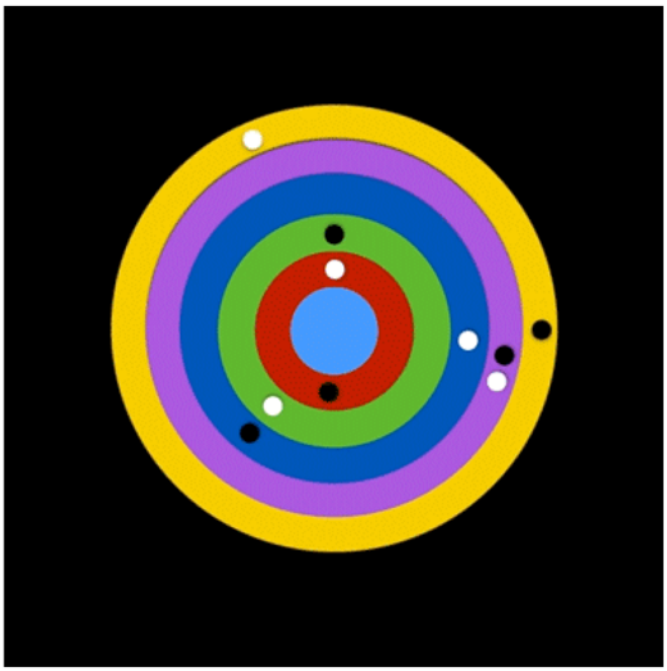


Figure 1. (Brillhart 2016)

This is a very useful tool in editing VR, and following Brillhart's "Heros journey" concept at an early stage of the production is recommendable.

5) Two-dimensional plane of screen

Continuity on the two-dimensional plane of screen helps to keep the viewer oriented in the VR world. Turning a room around differently to match eye-trace might be off-throwing for example, and break against the continuum of the two dimensional. The two-dimensional plane of VR is represented as an equirectangular image, exactly what it would look like if you peeled the image off a globe and spread it out. I'll talk more about this perspective in the later part about the editors work in storyboarding.

6) Three-dimensional space of action

By three-dimensional spatial continuity, Walter Murch means the way action flows through the space. For example if you follow a man through the length of the room, you match every cut to the one before instead of skipping anything. This was the norm in old Hollywood editing, but isn't followed rigidly today as we seem to prioritize rhythm much more.

In VR however, I would expand this, and the possibilities are endless. Cinematic VR is stereoscopic 3D, so "three-dimensional space of action" gets a whole new meaning. We have the power to transport the viewer within the three dimensional world as best serves the story or emotion. If the viewer is not on a treadmill they are not free to walk around, so the way the creators choose to use the space guides the whole story.

Also, how we situate characters in the 360 space, in relation to the viewer, has a lot of meaning. Seen from above, as we do in our story boarding tool, we can emphasize certain actions by placing them within the space.

4.2.1 Walter Murch's rule of six applied to VR

For applying to cinematic VR, I propose a slightly altered percentage of importance within the “rule of six”, and a different order:

1) Emotion 45%

2) Story 23%

3) Eye-trace 13%

4) Rhythm 10%

5) Three-dimensional space of action 8%

6) Two-dimensional plane of screen 2%

The biggest changes to the original list of priorities is the change of place between Eye-trace and Rhythm, and between two-dimensional and three dimensional continuity. The redistribution on percentages reflects the different priorities from the part above. The story for example stays the same, but as emotion gives away some of it’s points to eye-trace and three dimensional space of action, the smaller distance between them reflects the growing importance of the story.

Murch’s list can be applied specifically to versions one and two of my levels of editing: editing between worlds and editing within the world. Following emotion and story is at the core of the editors work here, just as in traditional cinema. When it comes to level three, the pre-production, we should be especially mindful of point 3-5; eye-trace, rhythm and three-dimensional space of action. In telling the story by guiding the viewer subtly within the world without edits, the use of these are our best visual tools.

4.3 How to approach the VR edit

In editing we are constantly anticipating what the audience will need to see, how they feel, and how they will react. Guiding them through the edits in virtual reality is about harnessing the same thought process as of acting as a guide. VR places the consumer in a tightly controlled, synthetic, trusted space. If you brake the viewers trust in VR, they cannot turn away because you are more or less right on their retina. This is why the language of images and editing is especially important to explore.

With the wisdom of Murch and our experience from traditional cinema, we should dive into the process of editing VR with a big tolerance for trial and error. Since emotion and story are still top priorities, we can start by trusting our instinct. The first versions of any edit are likely to be less than perfect, but that's exactly how it should be. As Jessica Brillhart put it, the brain needs time to rewire itself (Bye 2016). It's a new environment, and as we slowly let our mind wrap itself around the abstract idea of the 3D experience, the editors' sense of rhythm can start to adjust.

In Murch's words our job as editors is to anticipate and gently control the thought processes of the audience. If you are right with them, leading them ever so slightly, the flow of events feels natural and exciting at the same time (Murch 1998 p.69). Newton and Sokup speak of the same with their AX (audience experience) design for VR. They write that a good AX design can influence the audience's choice of where to focus "without overburdening them with that choice" (Newton and Sokup 2016). Both of these ideas are especially important in VR because the viewer is at that moment living inside the moment we are constructing. In order to make the environment as immersive as possible, we as creators should become as invisible to the audience as the technology itself. We need to be very present and very invisible for cinematic VR to work, because as one time CEO Eric Shmith said: "Technology will be so good it will be very hard for people to watch something that's not been tailored for them" (Serrano 2014).

We should also take care not to underestimate our viewers. Even if following a linear storyline in VR is a lot to ask, it really isn't impossible. It just needs a little more focus. Just as in the real world, where we continually decipher the environment around us and read the people who inhabit it, our instincts are automatically switched on in VR.

The first experiments made with editing in VR always focus heavily on cues. These cues can be pieces of music, a sound effect, a haptic response, a color shift, an animation or even a dimming of the areas of secondary action (Brillhart 2016). As useful as cues are specifically in VR, they are of course nothing new and have always been used in cinema. For VR we need to rethink the cues a little, because they need to be stronger because they are dealing with a much larger spatial area, but they also need to be much more subtle. If the cues are not subtle enough they risk breaking the immersion. The more obvious your cue, the more likely a viewer will pay attention to something— but the less immersed that viewer will feel in doing so (Brillhart 2016). The goal is to design the cues to make the viewer feel like they naturally felt like doing just what you wanted them to do, whether it's looking in a certain direction, blinking or moving. If the viewer catches the cue we are in danger of giving them the opposite response to what we are looking for, which is the natural impulse to disobey when you feel ordered around by an invisible authority.

In creating smooth cues we need to be very aware of sound design in the pre-production and edit planning. 3D sound is also an essential part of creating a sense of presence. Audio done well can help the edit along and guide the viewer through the narrative. It's very easy to brake the immersion by projecting sound poorly in 3D, the sound needs to come from exactly the right location (Hamburger 2016).

Important to remember when planning both audio and edit for cinematic VR is to take the step out and inhabit the space. We have a much larger canvas to paint on, even if cinematic VR at this point in time feels like trying to create a painting while inventing and carving your own brush at the same time (Gottschalk 2016). Storytelling in VR is much more about anticipating how a person is going to be and what they are going to do in a space, we need to speculate and test probabilities (Bye 2016). And ultimately, as Brillhart put it, it is more about the spirit of the story than the linearity of the story. All a creator can hope to achieve is constructing the best kind of experiential world for the for the experience to come across (Bye 2016).

5.0 The case, “Ego cure”

Since spring 2015 I have been involved in the planning and pre-production of a cinematic virtual reality fiction film called “Ego Cure” at Aalto School of Art and Design. The team has been growing steadily, involving members from different departments and with different backgrounds. Information about the project and its full team can be found in appendix 4. In the following parts of this work I will use “Ego Cure” as an example to explore a possible pre-production. I recommend that you read the full script at this point, it is attached as appendix 1.

5.1 The editors work in pre-production

Throughout the process of VR pre-production, the collaborative aspect is a strength. As the script develops, the team grows and more parallel processes start. The script interacts with the storyboarding, and they both interact with the previs and test shoots. Different people with their own expertise, like set designers, choreographers, animators, each join the project at different times and bring with them unique input. The difference to the traditional cinema process is that there is still time to effect the script as they join, and in a collaborative environment this can elevate the story as all the technical and artistic aspects are already taken into account during the script process.

The different structure of the VR pre-production can be a challenge to the rigorous processes of producing film. It is no longer in the films best interest to use the traditional marching order, creating strict deadlines for departments separately and engaging people only when they are needed. A VR piece would strongly benefit if most of the team is already assembled from the start. This can create financial issues that need to be taken into account, but ultimately a thorough pre-production can take months, or even years, out of the cost and time of the heavy post-production.

In the case of “Ego Cure”, the pre-production has been going on for almost a year. This is not only due to the demands of VR, but mostly to the fact that the team and budget has been in flux. Also, technical innovation is moving very quickly in VR at this point in time, and it’s hard to settle on one perfect way of producing the film. The long time

frame has had it's upsides though, since it has given us time to thoroughly consider and develop the tools and techniques we use for pre-production.

Next, I will go through the steps we took during this process. I will keep it brief for the sake of the reading experience, there is extensive material in the appendices.

5.2 Script

When the process of "Ego Cure" began there was a rough script. Since then the script has gone through many changes, but the core theme and characters are still the same. The changes and developments to the script have been happening simultaneously as all the other stages I am about to describe, and this has benefitted the script very much. The team members have been able to affect the outcome by bringing in their different points of view and knowledge. Instead of taking a script and forcing it through in VR, using whatever cinematic language available to do so, different aspects of the script have been developed to technically suit VR. The work around the script has not only been about what is possible to achieve in a VR space, but also has naturally led to new ideas and concepts as the script has evolved. The whole team has been able to contribute to the script, but the core team has been the director, the script writer and the editor. For "Ego Cure" the director is the primary script writer, and the additional writer was brought in as the final draft was nearly completed. The addition of the second writer brought along many interesting changes even at that late point, and after that the storyboarding process has done the same.

An aspect of the script development that has been especially interesting is how we have been incorporating different uses of VR into the script. For every idea, we get a new one, and so far the script has grown to include 2D in 3D, stereoscopic 3D, picture in picture, game engine animation, motion capture, moving camera and editing within the world. It seems that the way we use and develop cinematic VR within the script throughout the narrative, mimics the process of the audiences immersion. First you are a casual observer, then a compassionate observer, and lastly you become one with the protagonist.

5.3 Script analysis and script break down

With the script almost done we went into script analysis and script breakdown. My notes about this full process can be found as appendix 2, and are best read parallel with the script. The core team for the analysis was the director, the editor and the post-production supervisor. This team was sometimes joined by the producer, the motion caption animator and the unity animator. During the analysis we went through the script scene by scene and discussed it's different properties and challenges. If an idea was deemed impossible to work with it would be developed further to fit VR.

As an editor I focused mainly on the third of the levels I proposed for editing earlier in the text, how to guide the viewer within the world, and in which order the different elements were introduced, during this process. Since we can assume that most of our audience at this point are just only being introduced to VR, we need to introduce new things one at the time to avoid crafting an experience that is too overwhelming. At the same time, we should assume that future audiences are more used to reading the cinematic language of VR, and we don't want to loose them by being too careful. It's a fine line to navigate, and a process we continued into the story boarding.

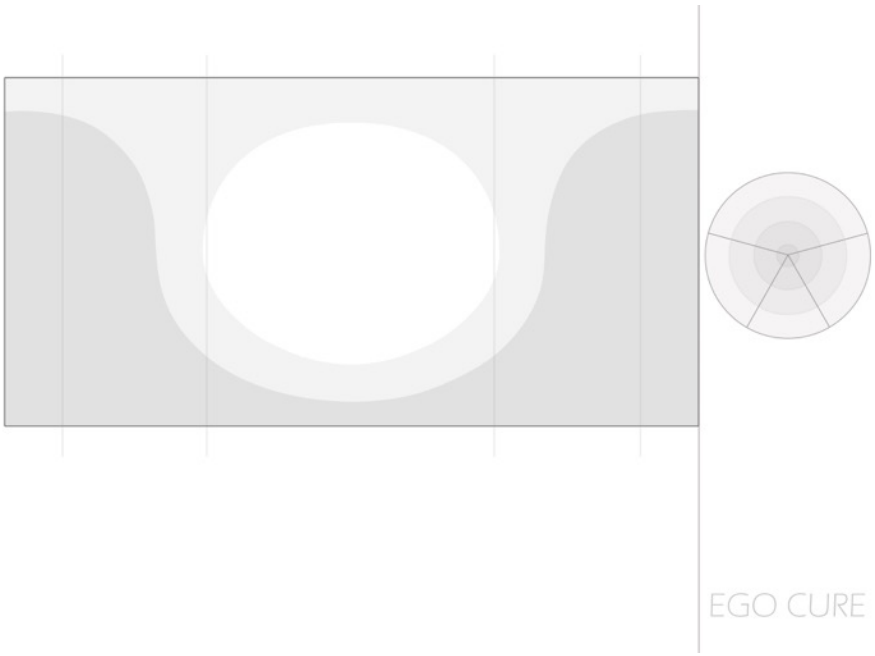
At this point of the development is is important to start planning both primary and secondary action. Primary action means the action that is directly relevant for the narrative, secondary action is what the audience sees if they choose to look around. VR as a medium opens up for agency and exploration, and not taking both these into regard at an early stage will affect the level of immersion the viewer can achieve. The planning of secondary action needs to be focused and clear about what the narrative really wants to communicate. How much do we need to show? There is misconception right now in VR that there needs to be something going on at as many fronts as possible. If we are going to tell remarkable stories with this medium, there needs to be a certain dramatic compression. If we stay aware of what needs to be said and experienced, we don't need to mask it by throwing five other things at the viewer at the same time.

5.4 Storyboarding

With a 360° canvas we can't just put the camera in the middle of a scene and hope that the viewer will find something interesting to look at. With a canvas this large we need to paint more than one picture. This is where careful storyboarding comes in. It's a process that should involve as many of the core team as possible, but at least the director, the editor, the cinematographer and animator, of course depending on the nature of the project.

In connection to the script analysis of "Ego Cure" we developed the tools we needed for the storyboarding. Cinematic VR benefits from both tests and pre-visualizations during pre-production. Before both of these however, it is very useful to apply the old fashioned pen to paper method. Going in to storyboarding we had many questions, and most of them we solved along the way.

Some of the things we struggled with were; how to make storyboards of a 360° environment, how to frame the action when we don't have a frame, how to stay mindful of the viewers experience and how to communicate the scene to the whole team. The last one might not be a problem in the future, but for now it is surprisingly difficult to collectively wrap your head around an equirectangular image. The template we developed looks like this:



The template combines three ways to communicate the shot: an equirectangular image, a top view and space for description in text. Depending on the specific team members thought process and experience with VR they can choose which method of communication opens up to them best.

The equirectangular image and the top view are divided into four sectors: main, curiosity, left and right. The sectors are divided into degrees of the 360°, and represent how a seated viewer sees different areas. In the equirectangular view we have both the sectors and a waveform. The waveform shows the borders of the sectors vertically as well, since we have limited range in head movement here as well.

We based our model template on research by Mike Alger (Alger 2015). He studied user interfaces for ergonomic multitasking in virtual reality, with an emphasis on user interface. His idea of how to design a user-friendly interface is directly applicable to cinematic VR, especially if the cinematic piece is designed for a viewer who sits down in a normal chair. We changed the degrees of the different zones, to fit narrative content. This is because we presume a person following a narrative for a certain amount of time in VR can be expected to look around more and feel comfortable doing so, than an office worker using an interface in VR or AR.

5.4.1 The sectors

The main sector is 150° wide and right in front of the viewer. You can rotate your head comfortably in 33°, and a maximum of 55° in each direction (Alger 2015). We decided to stretch the main area a little bit further than the comfortable rotation. This is the area where you want to place easily accessible information. In editing this is a good place to plan for points of interest in most of the edits. Moving action into the other sectors needs to have a clear purpose.

The left and right sectors take up 75° each, on the left side and right side of the viewer. The degrees on these sectors are designed so that the viewer can follow the action by turning his or her head to the extreme.

The curiosity sector is the last 60° behind the viewer. To see this sector the viewer needs to turn his or her body around fully. This means that there is a bigger sense of physicality to watching this sector, and it needs to be taken into account when placing action.

The round top view has, in addition to the sectors, the field of depth marked in four zones like rings of an onion. These zones are for placing the action so it feels relevant to the viewer, but also so that it is technically high quality. The inner most zone should be avoided because it is so close to the camera that it might make the viewer uncomfortable, or mess up the stitching if you are filming with a rig with multiple cameras. The two middle zones are for primary action, and have good parallax. The back zone is for mostly secondary action because beyond 20 meters you can't see as much stereo separation (Alger 2015).

The storyboard for "Ego Cure" is at sketch stage and is attached in it's full version as appendix 2. The sketches are combined with the notes from the script analysis and script breakdown, and followed by the work notes from the previs animation.

5.5 List of actions

Before going in to previs with the post-production supervisor I broke down the script into a list of actions. It's a simplified list of all the movements and actions the characters perform that makes making the short previs much quicker and easier. For the full "Ego Cure" script it took only two pages, they are added as appendix 3. The list of actions is a good reference point when scrolling through the script takes too long. It is like a shadow of the final script, and is useful especially alongside the storyboard.

5.6 Pre-visualization

The “previs” is crude pre-visualization of the action. The purpose of it is to:

- Test scenes in 360
- Make most of the mistakes before actual shooting (no editing can save us then)
- Test camera angles
- Test edits
- Test out spaces and props
- Test placement of characters in the space
- Time action
- Time and dialogue in order to make cuts in it before filming.

As in all visual effects heavy cinema, preproduction in VR is specific, intense and demanding, but very necessary. Every mistake made in previs is valuable, and saves time by eliminating possible re-shoots with actors later.

Since previs has been used by VFX film, cinematic VR can look to what has been done instead of starting at the very beginning. Mark Sanger, who was awarded an oscar for his editing of the film “Gravity”, has opened up the process of the pre-production of the film. In “Gravity” almost everything but the actors and their immediate props was computer generated. Sanger explained that most of the editing had actually been done in the pre-visualization stage. Sanger was on the team 14 months before the film was shot. After the previs had been made, it was remade several times before the film was shot. In this way the film and it’s edits were already planned and tested even before filming. When it was time for production Sanger and his team would send the previs of the scenes of the day to the whole team, and the actual footage would be filmed using that as a model. Sanger would then get the dailies and edit together a first draft so the VFX team could start their work, and the editing and VFX could communicate from there on to make the end result: a well paced film that ultimately is 3D animation with film footage inserted. (Travers 2014)[7]

[7] I attended a masterclass in VFX editing with Sanger at the HFF München Film School in 2014. The referenced article contains most of the same points

We made a decision about the previs of "Ego Cure" to divide the animated and filmed sequences into two different previses. The cinematic VR parts of the script were pre-visualized in 3D animation in the animating software Maya, and the motion capture and game engine scenes where pre-visualized and filmed using actors. The idea was that this would create cross-medial synergies. Also, we decided to leave out the 2D 16:9 parts from the animation, and only make a previs of the space they will be in.

The first version of the previs is a short one that just follows the list of actions point by point. The characters float through the space mimicking the movements, only moving action is timed right at this stage. When the first previs is rendered, it's time for the first assessment. Watching the storyboard come to life in a 3D universe and testing it in the HMD is a very humbling experience. There is no question of if something works or not, you know in an instant. The first previs is very useful for adjusting camera angles and cutting out unnecessary action.

The second previs is a longer version with dialogue added. First changes are made according to the first previs, and then the action is timed and edited to mimic the actual timing of the scene. The dialogue assists the timing, so it needs to be added at this point. Just a simple recorded read through is enough, the purpose of the previs is not to be artistically engaging. The second previs is the most interesting from an editor point of view. This is where you can see how possible edits flow, and where editing of dialogue happens. In a fiction piece for traditional cinema a lot of the dialogues rhythm and length are adjusted in post-production. This is not always possible in VR, since there isn't any back up footage to cut to, like close ups or reaction shots. Dialogue in cinematic VR needs to be cut before filming, timed and carefully planned.

Sanger used pre-recorded audio in the previs of "Gravity" as well, playing George Clooney's character himself. He would then edit the dialogue to simple animated storyboards and base the previs on the edited dialogue (Travers 2014). This is a good approach for VR as well, since it might take a while for script writers to wrap their heads around VR as a medium.

Going through previs of cinematic VR you realize that every little decision matters. Every fraction of an angle that changes in the position of the camera affects how you feel

about the scene. It's also very important to look at the previs at the height planned for the camera, it makes for a big difference if you watch a sitting camera standing up.

Ultimately, the previs is a rewrite of the storyboard in 3D. When the previs is done, our idea is to use screengrabs from Maya to replace the storyboard sketches. This saves time as it takes out one step from the process as there is no need to draw the storyboards. As the production goes on and changes are made to the scenes, the previs is easily altered and new screen grabs can replace the old ones. This again saves time and makes communicating changes smoother.

5.6.1 Analysis of the pre-production of Scene 8

In order to better illustrate the pre-production I will include a full previs and analyses of scene 8 of "Ego Cure". I chose this scene specifically because it is so far the only one in "Ego Cure" to use editing within the world. Editing between different camera angles as the action unfolds is what people have been most sceptical about considering that the viewer is in the middle of the action in VR. Both versions of previs and information about them can be found in appendix 3.

5.6.2 Script breakdown and storyboarding

The editing in "Ego Cure" is introduced gradually. The first edited parts are 2D 16:9 cinema, and after that we use time lapse to transition between scenes. The time lapses turn into action cuts and some picture in picture material. Scene 6 has very shortly before introduced interaction with the camera, the dancers have moved with it through their improvised dance. So at this point as we start editing within the scene, the viewer has already seen enough to perhaps be ready for some changes and the possible feeling of disorientation that brings.

Scene 8 starts out as a very simple scene, but ends up taking the viewer to a slightly different reality. It starts out with Emma and the dancers being caught in the action after having a very psychedelic improvisation. Kaylee enters with the curator and a camera team brought there to document the lead up to the premiere. We watch Kaylee turn on

Emma and the dancers melt away and finally the curator introduces a new form of punishment in form of the mask he places on Emmas face and the mask turns out to be a portal to a different dimension. The mask is referred to when the punishment is implied earlier in the script, so it has been a part of this world all along. Introducing this magical object so casually takes the story to the next level.

The emotion in the scene is pressuring. Kaylee and the curator confront Emma and no one stands beside her. This, and because of the magical qualities at the end, is why we chose to use editing within this scene. The editing strengthens the uneasy feeling of the main character and the shifting of reality.

The list of actions for scene 8 is as follows, divided into camera angles:
Camera 1
- Kaylee turns the lights on
- Kaylee walks to center stage, Curator walks to front row of chairs. Cut as they walk.

Camera 2
- Kaylee and Emma center stage. Dancers disperse.

Camera 3
- Jenna is washing her face by the sink
- Emma kicks bucket

Camera 4
- Curator gets up and walks towards the stage

Camera 5
- Emma runs for the exit. Can't get out
- Curator by the table (takes out mask)

Camera 6
- The curator walks over to Emma (and places the mask)

The storyboarding was made up of two parts. Firstly we planned the action and position of the characters, then the camera positions. I drew sketches of the camera positions for the previs, they are all attached as appendix 5.

5.6.3 Pre-visualization

After storyboarding we followed the previs workflow from above. First we made a short one without dialogue to test the edits, and then a longer one with dialogue where we made changes in timing and camera angles. If you haven't watched these versions yet in appendix 3, I recommend you to do so now.

5.6.4 Conclusions and development

The idea in preplanning was to try out a few different camera angles and see which ones are editable. We were under the impression that the smaller the difference between the two edited camera positions is, the more unnecessary and disorienting the edit. The render of the first version of scene 8 proved us both wrong and right. Especially the first edit in the scene is very problematic, mainly because of two reasons. Firstly, it is the first edit, and there is no getting around that we as viewers need some time to accept this new approach. Secondly, we are cutting to a close up in the same angle as the wide shot. It gives a feeling of making a strange kind of lurching jump. The change in angle is way too small to lessen the jarring feeling. To solve this in the second edit we took out the problematic "cam 2" position, moved the first edit a little further along in time into the scene and changed it to edit directly to the "cam 3" position. By taking out the problematic "lurch" caused by camera position 2, the rest of the edits in the scene became much more easily acceptable.

It seems that there are different rules depending on how close you are to the action. When you are far away from the action, the VR equivalent to the wide shot, your sense of being in control is stronger. As a viewer you are "the fly on the wall" and a voyeur. Accepting edits in this position seems harder. In the VR equivalent to the close up on the other hand, you have a feeling of being "in the thick of things". You follow the characters and the action closely, and in this perspective the edit is suddenly easier to accept. It is

almost as if we are watching a tennis match dialogue, but instead of turning our head to look at whoever is speaking our head is being turned for us.

The first short previs really revealed how tricky it is to edit within the scene. After the initial feeling of "this is never going to fly", something happens though. Surprisingly quickly you start accepting the edits, anticipating the next one.

The second longer version of the previs made us aware that we still need to adjust it according to Brillharts theory of the "Heroe's journey" (Brillhart 2016). The points of interest in the transition of the first cut, and then again in the last cut, don't line up perfectly. This actually makes a big difference and add a bit of confusion.

Changes will also be suggested to the script of scene 8 after trying out the dialogue. In the end of the scene the curator has a lot of monologue at the same time as some very tense action is going on. We found that the talking gets in the way of the action, and that the distances the curator walks and actions he performs become ill-timed. Almost half of the lines at the end of the scene could be edited out.

5.7 Technical tests

During the whole process of the "Ego Cure" pre-production, the team carried out many series of technical tests. The editor probably has limitations when it comes to knowledge about testing cameras, I know I have, but I think it is very useful to include the editor in the testing and planning as well, at least as long as the medium is new. The technical tests bring a learning curve that inspires new ideas and maintains interest in the project. Having a good understanding of how the medium works is also beneficial for the other stages of pre-production and later post-production.

The team of "Ego Cure" made tests to try jump cuts with central perspective, interaction with the camera, moving the camera vertically, and playing with depth of field. These have been directly used in the storyboarding and script rewrites, and have been made mostly in 360° video, with a GoPro rig and the Kodak PixPro. The technical tests of the camera department have been mostly focused on how to stitch 3D characters into a

stereoscopic photosphere, and carried out by the director, cinematographer and post-production supervisor.

5.8 After previs

Next step for "Ego Cure" is finishing the animated previs and then based on that making a version of the full film in 360° video. The filmed previs can then be test edited, and this edit will be the base of the last rewrite of the script before the actual shoot. The shoot for "Ego Cure" is scheduled for the fall of 2016 and I will be using the knowledge I acquired during pre-production to work as assistant director.

6.0 Conclusion

Perhaps, at the end of the day when we have made enough mistakes, we will find that Pixars co-founder Ed Catmull was right when he warned moviemakers that virtual reality is not storytelling. He went on to say that "movies aren't books and they don't need to be" meaning VR doesn't need to be cinema (Dredge 2015). I agree that VR's strengths might lie elsewhere, and that just trying to make a film to be viewed in a headset is the wrong way to go about it. "Filmmaking is not a one to one fit" Jessica Brillhart said (Fusion 2016). Instead of trying to push the square peg into the round hole we should approach this in a different way to create something completely new. As Shari Frilot, Sundance Film Festival Senior Programmer put it: "This is not only about adapting film for VR, it's so much more than that"

In the not too distant past it was impossible for us to even begin to imagine how the PC, or the internet would come to shape our lives or how dependable we would become of smartphones (Newton and Casey 2016). VR today is at just that stage. The possibilities are endless and the future can bring any number of things, from apocalyptic visions of isolation to the freedom of being instantly transported or living parallel lives. It's easy to get caught up in the potential of a new technology, particularly during its infancy, and while dreaming big, we should try to keep a level head. VR as a medium for film is very specific, and as artists on the cusp of this wave we have a responsibility to not only go forth and explore, but also see to it that the material we actually release is of high quality.

At this point the expectations of VR are huge, and very inflated. The initial response when the consumer VR takes off is probably going to be a quick "wow" followed by a slight disappointment, because there is no way to match up to the hype of being a life-changing medium. We'll probably see a lot of articles proclaiming VR dead and accusing it of having been just a commercial gimmick. And in some ways they will be right, for better and for worse. Since VR is an industry, and as such trying to make money short term, the inevitable coming slowdown of cashflow will impact the number of companies involved in it. As this happens, hopefully the makers of content will keep going just as they have done in other mediums in the past. As the content develops with a little more time, and costs for building hardware go down even further in the coming years, thats when things will become truly interesting. So let's take our time to explore this new way of storytelling, build it carefully from the ground up, and enter the scene once we are truly ready for it. As Janet Murray recently put it: "Our work continues whether commerce makes money or not." (Fusion 2016).

When I started working on this thesis and the project "Ego Cure" connected to it, I was still not sure if VR would prove to be just a quickly passing trend this time around as well. During the past year I have come to believe that it is not so. Especially if artists, journalists and filmmakers adopt the medium and make it theirs, the spectrum and quality of content will be such that it cannot go away. This time around VR is here to stay, we are in for the long run.

So then, will cinematic VR be the death blow of traditional cinema? I believe not. Walter Murch expressed it best by comparing the silver screen to the camp fire we all gathered around to tell each other stories. It is embedded into us to get together as strangers to experience narratives and feel emotions socially. That impulse is never going away, and we will keep returning to the darkness of the cinema to watch the flame of the screen (Murch 2016).

As filmmakers we should take an interest in this emerging medium whether we want to work with it or not, and the time to do that is now. There are clear possibilities in cinematic VR that can broaden our spectrum as storytellers. As technical as the medium can seem now in it's early days, it is actually very human-centered. VR relies on the creators to have taken all aspects of the viewer into consideration. This is true both

considering physical aspects of the experience, like combatting nausea, and considering how we can craft the psychological experience. Computer scientist Jaron Lanier said "You can't ask people to meet you halfway anymore. You have to really go to the people to get VR to work.", he believed VR would turn technologists into humanists (Newton 2016).

I want to end with a quote from filmmaker Werner Herzog. He cited the Prussian war theoretician Clausewitz, who in Napoleonic times said "Sometimes war dreams of itself." Herzog asks the same question about VR "Does virtual reality dream of itself? Do we dream or express and articulate our dreams in virtual reality?" (House 2016). The answer to this remains to be seen, let's put it to the test and find out.

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8.0 Appendix:

Appendix 1.

EGO CURE

Fourth Draft
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1 INT. FOREST / DREAMWORLD - NIGHT 1

A gush of wind runs through a dark, scary forest. The only real source of light is a dim lamppost in front of us. Around the illuminated patch of ground, underneath the lamppost, sits seven masked DANCERS. The dancers are all wearing identical EGO CURE MASKS; white, podlike visors encapsulating the whole head. Rough FESTIVAL BANNERS stretch from lamppost to the ground, making the post resemble a maypole.

EMMA, 32, a shaky choreographer walks around inspecting the dancers with a worried look on her face. She suddenly stops. One of the dancers is wearing the exact same clothes as Emma is. Emma gestures the dancer to rise.

An identical copy of Emma, but with a pod instead of a face, stands up. Emma waves and the Copy immediately mirrors her gesture. She moves her head from left to right and the Copy mirrors that too. Emma continues performing simple gesture, only for them to be replicated by her Copy.

Emma is shocked. She slowly moves her hand closer to her Copy's face and... SUDDENLY grabs the mask from both sides.

A LOUD SHRIEK, followed by a low humming sound. Emma tries to remove the mask as the Copy shrieks in pain, flailing its arms around, trying to escape Emma's hold.

All the other masked dancers suddenly rise and attack Emma, trying to pry her away from the shrieking Copy. Just as Emma's fingers slip from her Copy, the mask opens, revealing only electric wires and tubes, instead of a face. Emma's face fills with horror as the dancers drag her into the darkness.

Applause. Behind us sits a shadowy audience, previously unnoticed, giving a disturbed standing ovation.

2 INT. STUDIO, STAGE - MORNING 2

A dimly lit studio. Emma raises her ruffled head out of her sleeping bag. She looks at her phone, the clock shows 6AM.

Emma crawls out from underneath a heavy table and falls into her chair. She turns on a small lamp. The table is filled with photos, binders, a laptop, a slick RED BALLPOINT PEN, books on her performance theory and a single lonely houseplant.

The overhead light is suddenly turned on, revealing the studio floor around the table, cluttered with dancers who are now moaning and slowly waking up. One of them is already doing Yoga. The studio is very messy.

KAYLEE
Morning.

KAYLEE, 28, the producer, approaches the table, carrying a briefcase with the company logo on it - that of a dark tree. She instantly begins arranging folders, laying out the schedule for the day. The mass of dancers spreads across the room, each of them performing their morning routines.

KAYLEE (CONT'D)
What time did you finish yesterday?

EMMA
Ugh, you don't want to know. Jenna had trouble concentrating---

JENNA
(interrupting)
Not my fault.

A prominent dancer JENNA, 41, passes the table in a hurry.

EMMA
--- And so was I. Felt like we were starting from zero.

KAYLEE
You're just freaking out because of the premiere tomorrow.

Kaylee looks up from the daily schedule, addressing the dancers in a loud, shouty voice.

KAYLEE (CONT'D)
We're starting with "Cunningham" and the "Reflection Motive" in 15 minutes. Warm-up before that.

Emma picks up an extraordinarily thick and scrappy binder, which has notes and sketches flowing out from the sides.

She drops it demonstratively on the table. "Part 3" is written on the cover in thick black marker. Kaylee puts down two very clean and well organized binders marked "Part 1" and "Part 2" next to it. Kaylee carefully lifts the cover of the ugly binder and closes it fast, face filled with shock.

KAYLEE (CONT'D)
This only needs the solo, right?

Emma grabs the "Part 3" binder, takes Kaylee by the hand and leads her to the far side of the room. Emma leans over to Kaylee.

EMMA
You've got to help me. I've got nothing here...

KAYLEE
What do you mean..? You've been working on this for weeks.

Kaylee grabs the folder from Emma's hands and begins perusing it. Several pictures and papers leak out of the binder and fall to the floor. Kaylee kneels down and begins sorting through the material.

EMMA
Nothing. It's nothing.

KAYLEE
Okay... So what if we just cut this part?

EMMA
Impossible. That would be like walking on one leg. It needs the ending.

Kaylee gives up on sorting and stands up, now almost freaking out. She takes out her phone and begins typing like a maniac. Emma just stares at the floor.

KAYLEE
Well we need something to show for tomorrow! Oh lord, the cameras are coming today. I need to call The Curator.

EMMA
No, please. Don't. Just give me until lunch to go through the notes. I don't want to create a scene.

Kaylee suddenly looks up from her phone.

KAYLEE
Emma, have you read your contract!? Causing a scene is the least of your worries.

3 INT. STUDIO, STAGE - DAY 3

Jenna is lying on the floor surrounded by random pieces of fabric, a microphone in her hand. Four dancers are lying on top of her chest making it hard for her to breath or speak. One dancer stands next to pile making overly sad faces.

JENNA
(performing)
Everybody is waiting for instructions. Just 'cause you're the boss doesn't mean you can let your people hanging like that. Don't you see, they are nothing without your guidance? They stop showering and get depressed!

EMMA
(loud)
Let's scrap this one too. We're moving to the next one.

Jenna sighs. The dancers stand up and stretch.

Emma and Kaylee are sitting at the table - Emma on top of it - watching the performance. Emma strikes out an entire page from the "Part 2" folder - the Ballpoint Pen breaks and RED INK spills out over the page, as well as on Emma's hand. Emma starts playing with the broken pen, spilling ink on potted plant next to her.

KAYLEE
Stop making a mess.
(loud)
Next one is... "Melancholia", 10 minutes for preparation.

The dancers take pieces of PVC pipe and fix them to their limbs with strips of bandages, making it impossible to flex certain joints. They start doing a synchronous choreography in the background.

Emma walks up to the "Part 3" folder that Kaylee was working on, picks up a note seemingly at random and starts miming the movement. It's a very rough sketch. She quickly gives up.

EMMA
Ugh! There is absolutely no purity here.

She crumbles the paper and throws it away in disgust. Kaylee picks it up from the floor, straightens it and puts it back in the folder. Emma kicks the table and pants in frustration.

EMMA (CONT'D)
I need... I need... I need breakfast.

Emma, short of breath, stumbles away from the table, dancers curiously stopping to see where she is going. Kaylee shakes her head in disbelief.

4 INT. CHANGING ROOM - DAY 4

Emma is sitting in a stuffy-looking changing room, eating a pear. It's messy and dimly lit; the mirrors and walls are covered in posters, post-its and pictures.

A dialing sound. Emma is staring at the mirror-covered wall in front of her, holding her phone to her ear. Her face sinks into her palm. She takes several deep breaths. Someone answers.

JOSHUA
(phone)
What's up Emma? You never call this early?

EMMA
Oh shit, I'm sorry. What time is it there?

JOSHUA
Like 4 in the morning or something, but it's cool. Last nights practice got out of hand and... we're still partying. (laugh) Martin is on the floor, literally peeing himself from laughter! Kata brought this Indonesian sailor home and he's now teaching her the sacred art of knife fighting...

EMMA
I miss you guys.

JOSHUA
...Yeah, and I'm taking notes, obviously. Next time I see you, you're going down, bitch!

A smile appears on Emma's face. She stands up and goes to the mirror, smearing dried up red ink from her hand on the mirror as she talks.

JOSHUA (CONT'D)
What's up, miss headliner? How's the festival? Still coming to Vienna?

EMMA
Not with this production I'm not. It's all mundane shit. Nothing even remotely interesting.

JOSHUA
Emma. Stop it! It's going to be spectacular!

EMMA
Yeah..?

JOSHUA
You're nervous! Just get out of your head and focus.

EMMA
Yeah, nervous.

JOSHUA
Scrap the stuff that you don't like and go from there. Trust your intuition. And me. Because this works every time. (laugh)

Emma gives out a hesitant smirk, followed by a relieved sigh.

5 INT. STUDIO, STAGE - DAY 5

Enna struts into the room, now looking more confident than before. The dancers are all staring at their phones, looking bored and frustrated. Kaylee is sitting in Emma's spot at the table. The papers are neatly structured and laid out in front of her. Kaylee get's up and gestures Emma to sit down.

KAYLEE
(calmly)
Look, we're going through the ideas now, one by one. We prepared everything, even the stuff from three months ago. So all you have to do is sit here and say "in" or "out". "Yes" or "no". How does that sound?

On the floor next to the table is a huge grid of post-it notes, structured into what is the choreography. Kaylee is holding notes in her hand and reads out loud.

KAYLEE (CONT'D)
Let's start with the first one... "Monochrome".

The dancers start performing the action. Jenna pushes one dancer, the other dancer pushes back.

JENNA
Aaaahhhhh!

DANCER
Aaaahhhhh!

JENNA
Courage!

DANCER
Coward!

JENNA
Purity!

DANCER
Performance!

The performance ends. Kaylee, Jenna and all the dancers turn their gaze to Emma.

Emma picks up a stack of notes and flips through them with a anxious look on her face - the rug was pulled from under her and her good mood is now gone. Kaylee sighs and scribbles something on the post-it and puts it back. The dancers all exchange frustrated stares - everyone but Jenna, who looks worried.

KAYLEE
Okay, undecided I guess. Let's move on. What about this one?

Jenna picks up a microphone. The other dancer starts whispering things in her ear that she then screams into the microphone.

JENNA
I - AM - A - FRAUD.

The dancer whispers into Jenna's ear.

JENNA (CONT'D)
ONLY - MANIA - NO - LOVE.

The performance ends. Emma hides her face behind the stack of notes in her hands, ashamed.

KAYLEE
Yes or no, Emma? It's time to make up your mind.

Emma doesn't answer, her face still in her notes. The dancers are now shaking their heads and loudly sighing.

KAYLEE (CONT'D)
Stop fooling around Emma!

Silence. Jenna walks over to Kaylee and whispers something in her ear.

KAYLEE (CONT'D)
(quietly)
No Jenna, she had several months on her to fix this. All the time in the world for second thoughts and whims. If she can't---

Kaylee is interrupted by her phone. She looks at it and panics. She stands up, gestures the crew to keep going on without her and rushes out of the studio.

KAYLEE (CONT'D)
Oh God... (answers the phone) Hello there! So glad you called!

Emma takes the notes from her face. Her hands fall in her lap, showering her body in pieces of paper. Jenna scratches her head.

TIMELAPSE

6 INT. STUDIO, STAGE - MOMENTS LATER 6

Stagehands are preparing the studio, placing rows of chairs and turning it into a performance space with a stage. Emma is still sitting on her chair, sulking. The dancers are all staring at their phones.

Jenna walks around Emma's mess and inspects the notes on the floor. She suddenly stops. She picks up a little BOOKLET From the remains of the "Part 3" folder and begins reading it.

EMMA
I think I somehow pushed this from the wrong angle. I don't know. I wish I could start over.

Jenna suddenly claps her hands.

JENNA
(shout)
Then why don't you!

Emma is startled. Dancers look up from their phones.

EMMA
Start over?

JENNA
Yes! Let's try something completely different. Let's do...

Jenna lifts the Booklets in front of Emma's face.

JENNA (CONT'D)
This one!

Emma chuckles.

JENNA (CONT'D)
Come on Emma!

EMMA
That's not a choreography.

JENNA
Then what is it?

EMMA
It's a mantra. Something I wrote when I started this whole madness.

Jenna grabs Emma by her shoulders and pushes her up on the "stage". She gestures for the other dancers to join her. They get up and form a circle around Emma.

Jenna grabs the microphone and begins reading from the Booklet. The lights are suddenly dimmed.

JENNA
I want to live on the outermost layer of reality. I want to feel everything in its entirety. When I am scared over the realization of my own mortality, I want to weep and fall to my feet and marvel at the futility of my endeavors. I want to lose all but a glimmer of hope for control. I want to live and I want to be alive. Storms of ethereal conquest - feast on me! Uncertainty is my fuel. Change is my fuel.

While Jenna repeats the monologue, Emma and the dancers begin slowly swaying and dancing. This slowly escalates into a crazy wild dance in dark:

The dancers start bringing out props and clothes out on stage - which suddenly resembles a shamanistic circle. They draw up a tent out of large pieces of fabric around the circle.

They scream and sing together. They start taking papers and post-its to build constumes of colorful feathers, decorating everyone. They draw arcane symbols on Emma with red ink with their hands and fingers. A dancer approaches Jenna from behind and paints her mouth red with one broad stroke of the hand.

7 INT. STUDIO, LOBBY - DAY 7

Kaylee and the CURATOR are walking down the lobby towards the front door, beneath a huge Festival Banner advertising the Contemporary Dance festival and its headliner Emma. Kaylee is lugging around a bunch of papers and is holding her phone in one hand.

KAYLEE
I know that we promised the camera team 2 hours alone with Jenna, but we still need some time for last minute adjustments.

CURATOR
"Last minute adjustments"? I thought you said everything was going fine.

The Curator chuckles in an awkward manner. The duo reaches the front door where the camera team is waiting outside. Kaylee opens the door and waves them in. They walk towards the Studio Stage and reach the door to the Studio.

KAYLEE
(whispers)
Oh, it's nothing. Emma has just been a bit nervous over some of the parts. You know, she can be a bit artistic like that. But I'm sure she'll, uhm... Not let her ego get in the way.

Kaylee opens the door and turns on the overhead light in the Studio:

The light reveals Emma and Jenna standing inside their catastrophic ritual circle. All the binders are scattered on the floor, ripped up. Papers have been turned into a nest. Both Emma and Jenna, standing next to the buckets of red paint, have red ink smeared across their faces.

The scene reminisces an ecstacy-fueled rave after the lights go on, revealing a group of pale sweaty strangers.

CUT TO:

8 INT. STUDIO, STAGE - DAY 8

Kaylee and the Curator enter the Studio and walk towards the messy stage. The door behind them is closed. The camera team starts setting up the camera and sound gear, nonchalantly getting ready to film.

The Curator walks up to the first row and makes a sound while adjusting his chair to sit down. Emma looks at him shocked, surprised to see him then and there.

CURATOR
Please, don't let me disturb you.

The Curator leans back in his chair and takes out his smartphone. Kaylee strides over to Emma, avoiding puddles of paint. She drops to her knees and starts collecting little pieces that are left of the binders, looking disgusted of the mess.

KAYLEE
(whispers to Emma)
What the FUCK happened?

EMMA
(trying her hardest to sound calm and controlled)
(MORE)

EMMA (CONT'D)
Kaylee. We're doing this my way now. I'm the creator---

This hits Kaylee's nerve and she quickly rises to her feet, interrupting Emma.

KAYLEE
The creator of what!? This whole carneval of yours stopped making sense a month ago!

Emma is furious. She looks around for the dancers but they are all back on their smartphones, looking as uncaring as before. Jenna is at the sink, maniacally washing her red face, while the camera team is filming her.

EMMA
(hurt)
I'm trying to make something fresh and---

Kaylee interrupts once again.

KAYLEE
What is it exactly that you trying to make? Because right now you're just acting out your fantasy of being a clichéd mad genius. "Ooh, I'm so deep and misunderstood".

Emma kicks the last full bucket of red paint over and it floods the remainder of the notes and folders, as well as Kaylee's feet. The dancers look up from their phones. Kaylee is livid.

CURATOR
Okay, okay. I've seen quite enough...

The Curator gets up and walks towards the stage. He has a silver suitcase, wearing the company logo, in his hand. Emma panics and backs away towards the wall. She's trying to speak but her shock turns her words into stutter.

EMMA
No, no, no... You can't do this.

The Curator puts the suitcase on Emma's table, whiping a few notes away in the process. The suitcase opens, revealing the Ego Cure Mask inside it. The Curator picks up the mask and turns to Emma.

CURATOR
When we first chose you as our headliner, we were sure you would create something never-before seen.
(MORE)

CURATOR (CONT'D)
I think we all know the modern audience doesn't want something good, or even great. It wants to be part of changing history. It wants to be part of something so new, that it's going to reshape the whole artform!

Emma is hysterical. She tries to open the emergency exit, but it's locked. The Curator carries the mask towards Emma. Emma backs up against the wall and raises her fist, still red from the spilled paint.

CURATOR (CONT'D)
I'm sorry, but you are contractually obliged to provide us with that... and we are contractually obliged to extract it from you in case you fail to deliver. Which you have - You have failed to deliver.

Emma raises the other fist as the Curator closes in. Everybody in the studio stands frozen, not daring to say anything.

CURATOR (CONT'D)
Emma. No amount of struggle will help you.

Emma walks toward the Curator and suddenly lowers her fists. The Curator grabs Emma's shoulder gently and guides her to her chair. She sits down, completely defeated.

CURATOR (CONT'D)
We'll just step inside your mind, make some minor changes and take what we need. It'll be over before you know it.

The Curator places the mask on Emma's face. It makes a strange sound to which the entire room reverberates.

CUT TO:

9 INT. CHANGING ROOM - DAY 9

Emma is brushing her teeth in the changing room, sitting down and watching herself in the mirror-wall. The room has been cleaned up, and it even appears lighter.

Emma casually rises from her seat and walks over to the other side of the room, opens a door, and disappears into a bathroom. We hear the sound of running water and Emma spitting out toothpaste. She then exits the bathroom.

Emma walks across the changing room, next to the mirror, when she suddenly stops. She stares into the mirror.

EMMA'S POV: Emma looks at herself in the mirror and the user controls Emma's head-movement. After enough movement the sync with the head will be skewed. At this point the mirror suddenly breaks and the walls disappear, making the surrounding nothing but a black CGI plane.

Behind the mirror is a CGI Emma, with the Ego Cure Mask on her. While the viewer still controls the head, it is now covered by the mask, shaped after Emma's head.

CGI Emma's hand suddenly grab the mask, and tries to remove it. AN ANGRY SHRIEK. Emma begins hitting the mask, resulting in hanging limbs and loss of user control. One final punch and the user loses all control. The gravity suddenly changes and pulls Emma backwards into a now visible portal.

CUT TO:

10 INT. CGI EMPTY PLANE // THE MACHINE - CGI EGO CURE WORLD 10

The CGI Ego-Cured Emma is sitting on the floor of an endless, virtual plane. Her both CGI fists are melded shut. Her head sinks in exhaustion from all the hitting. A buzzing sound, as if white noise from a monitor makes Emma look up.

A monitor blooms from the ground, attached to a root. The monitor flickers and plays a video of The Curator talking.

MONITOR CURATOR 1
We need you to do something ground-ground-ground-ground-groundbreaking!

A second monitor pops up next to her.

MONITOR CURATOR 2
The audience is not happy - not happy at all. They've seen it all before! Innovation is born from outside-the-box thinking.

Emma rises and stumbles backwards, but almost bumps into something: A third monitor.

MONITOR CURATOR 3
We need to make your performance - your story - fresh. We need to make you the tortured genius you dreamed of being.

Emma turns around, now revealing the gigantic DARK TREE that has grown into existence behind her. The tree bares fruit: dozens of Ego Cure masks hang from its branches.

Emma tilts her head, revealing the trees size to only be an optical illusion, the tree in factuality only being a few meters high.

MONITOR CURATOR 3 (CONT'D)
You are not very original, you know.

Emma, annoyed, tries to slap the monitor, but is unable to do so as her hands are clenched fists. She concentrates and squeezes her right hand open with willpower. She forces her pixellated left hand open with her right hand: it is still smudged with red ink. She slaps the monitor with her smudged hand.

The monitor suddenly vibrates, changing shape and becoming transparent for a second. It returns to normal. Emma looks at her red hand and places it on top of the monitor. The monitor begins vibrating again, and now being transparent enough to show its innards: slick, bioluminescent VESSELS, resembling blood vessels run from the monitor, through the root and into the ground.

Emma's slaps the monitor really hard, again, this time revealing the vessles going far underground, stretching to the tree and also to RED PAINT BUCKETS.

Emma sprints over to the red paint and dips her hands in it. She touches the floor with her red hands, revealing a massive amount of vessels underneath it. They all seem to be leading to the tree... Emma rises and looks at the red paint, now spreading across the floor.

Emma turns around and begins running towards the tree, but is suddenly stopped by monitors popping up from the ground. She tries to go around them, but is stopped by another set of monitors blocking her path. This continues until Emma, as well as the user is stuck inside a monitor tower.

Emma tries to push the monitors over, but nothing happens. She looks at the user and slowly walks to your right side. As the users gaze follows, the towers shake slightly. Emma walks to the left side of the user, with the same reaction from the tower. She begins running left and right, left and right, making the tower shake. This is however not enough for the tower to break, so Emma sits down in front of the user, back turned towars you, seemingly defeated.

EMMA
You think you got me where you wanted. You think you're sitting in the darkness, completely safe...

Emma suddenly turns around, throwing her shoe at you, the user. The user ducks fast, making the head movement violent enough to break the tower. The tower crumbles and Emma is freed.

EMMA (CONT'D)
You think you "deserve" to be entertained. That you have the freedom to roll your eyes at me as you watch me suffer. You are wrong. You are not free.

The CGI world outside the tower has now turned into a sea of red paint. Amidst the ocean is a single, lonely island, with the tree sitting firmly on top of it. Emma wades towards it, dipping her hands into the red paint once again.

EMMA (CONT'D)
You are caged - trapped between your frain hope to be noticed - and a crushing fear of being called out.

Emma walks up to the tree, forcing her hands into it. The tree begins violently SHAKING and SHRIEKING. It begins glitching, vessels begin breaking and the world trembling. The tree finally collapses, opening a portal in its place.

EMMA (CONT'D)
You are paralyzed, commodified and digitized.

Emma takes a few steps back. She smears red paint on the pod on top of her head. It cracks open, revealing her face.

EMMA (CONT'D)
So if you think I am pathetic or delusional... Just look yourself in the mirror.

Emma runs through the portal.

THROUGH BLACK:

11 INT. STUDIO, STAGE - NIGHT 11

We are back in the studio, now sitting in the audience, watching Emma's premiere show. Emma is sitting next to us, dressed to the ninens, and looking nervously at the performance.

The dancers stop on stage. The lights go black.

A ROAR OF APPLAUSE fills the room and the lights come back on. The dancers walk to the front of the stage and begin taking their bows. The audience is loving them.

Emma sighs in relief. She begins laughing and clapping. The audience rises around us for standing ovations. Emma looks at the user, her eyes reflecting a sudden realization that she's woken up to the end of her journey. THE END.

Appendix 2: Story board script brake down and process notes for "Ego Cure"

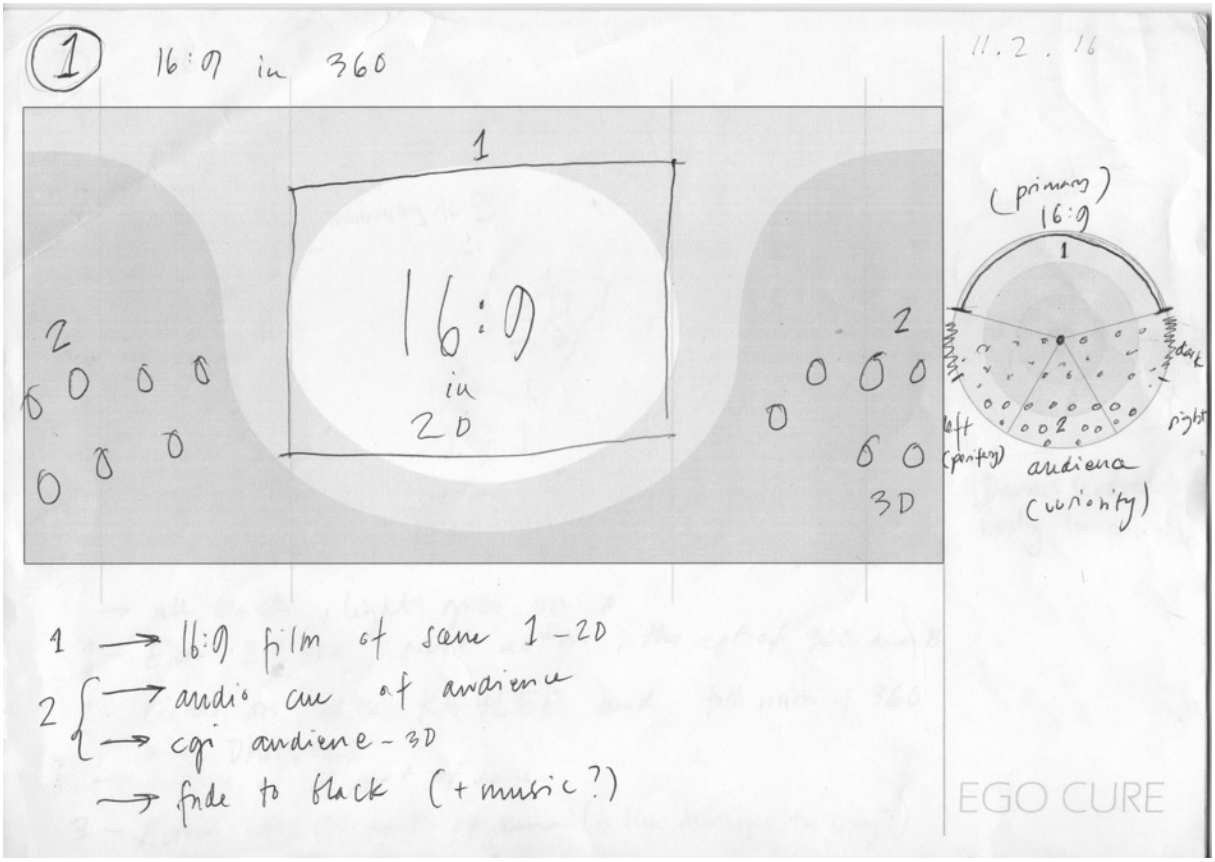
SCENE 1

Description:

The first scene, a dream sequence, played on a 16:9 screen in 2D in a 3D space.

Analysis notes:

- The first scene defines the space and the fields of view within, the 16:9 screen covers the primary field of view and the audience fades in in the curiosity zone.
- This also introduces the audio cue as a means of communicating new content (the applause)
- The first scene and introducing VR to the viewer. What it means to begin in cinematic 16:9 and introducing a movie audience.
- Were saying "forget everything you thought about this medium" and asking them to trust us.
- The same space with audience and 16:9 screen returns in the end



Questions and decisions during PREVIS:

About the space:

- Size of the movie screen, what looks impressive enough and matches the theatre at the end? Tennispalatsi 1 measurements are 8,8x21 (meant for cinemascope) so we are trying with 11x21 and testing it in the oculus
- How big is the blank space we are in?
- The idea is to have the screen in the primary zone, but the size might be too small if we don't let it overlap into left or right. One test with a flat screen, one with a slighly concave one (-10 degrees)
- How far away is the screen from the viewer? 0,8 times the height of the screen (https://danielesiragusano.files.wordpress.com/2011/04/fig_2.png) =9,44m. The screen is at a height of 1m.
- Distance between row 0,5m, height differs between rows 20cm

About the characters:

- How many people do we need in the audience? Is is more symbolic?
- Do the people need to be realistic and in 3D? Test with a 2D cut out. -> did not work because of thin slices of people at both sides :), going for 3D at least at first row.
- How many rows of people (5), how many people per row? In the end product we are imitating the actual katsomo built for the set. These numbers are what we could imagine it to have (https://pro.sony.com/bbsccms/static/files/mkt/digitalcinema/Why_4K_WP_Final.pdf)

User experience:

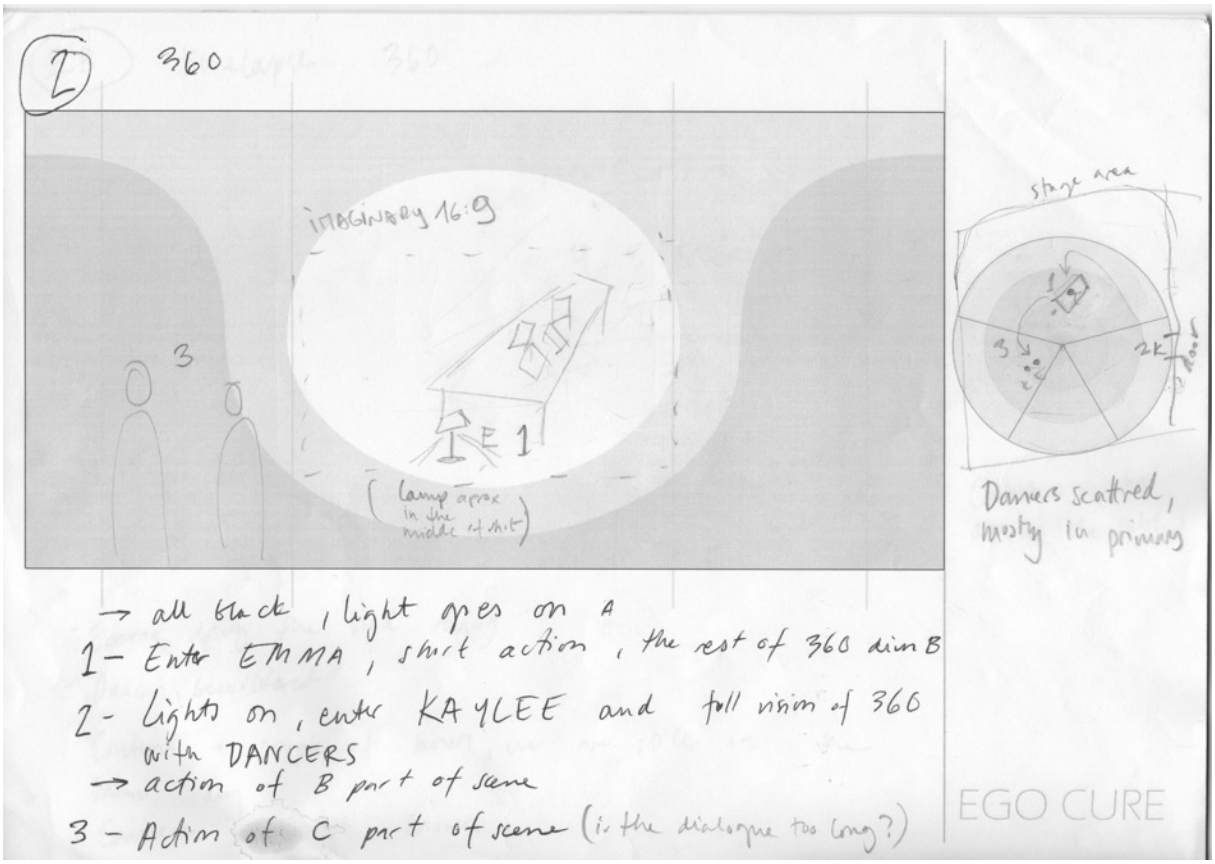
- How high is the viewer? The angle of the camera is consistent. The average eye level of a seated man is 790mm (measured from the seat), of a woman it's 740mm. We ended up trying a high average, 770mm (http://www.firstinarchitecture.co.uk/average-heights-dimensions-of-person-sitting/). in total with the seat an average of 125cm.
- What emotion will it create to be surrounded by these humanlike characters? How about when the lights go out just after you notice them? Is this the effect we are looking for?
- Would the effect be better if they are behind you?
- Open questions: mitä tarkottaisi laittaa previstä varten unityyn, vai redrataanko vaan.

- Sitting on the first row is never fun, not even in VR. The screen is just too close. We are moving away from the realism of actual cinema rooms and moving the benches further back.

SCENE 2

Description:
A fade to black of scene 1. A light goes on, its Emma in the 360, with the dancers behind her. The feeling of the curiosity zone is the same as in 1, its dark and not so important. The Emma part of the scene plays out in her dimly lit corner util the lights go on and the full 360 is revealed.

Analysis notes:
The primary field of view is still the same. Now its the 3D movie of Emma that wakes up.



Questions and decisions during PREVIS:

About the space:

- What is the size of the room? We are trying 18mx13m, something between Lume studio and studionäyttämö. height: 6m, would be at the point where the light rigs end?
- Dimensions of table, now testing 120cmx180cm. Height 65cm

About the characters:

- Height of Emma? were going with 168cm

About timing:

- How long before the main lights go on? 10-15s
- Kaylee by the door 5s
- Kaylee walks through the room 15s

User experience:

- In the first scene, the viewer is at the centre of the room
- The height of the camera, two tests. The idea is to have the camera on sitting height at all times, but when the action comes close to the viewer this might be awkward. We are making a second test with a standing camera as well.
- The opening up to 360 is gradual. It removes the possible problem of losing the viewer to staring around. (cite the VR artictle that states this actually is bullshit, then say it can still be a problem at the early stages and I chose to adress it like this).

Questions and decisions during PREVIS 2:

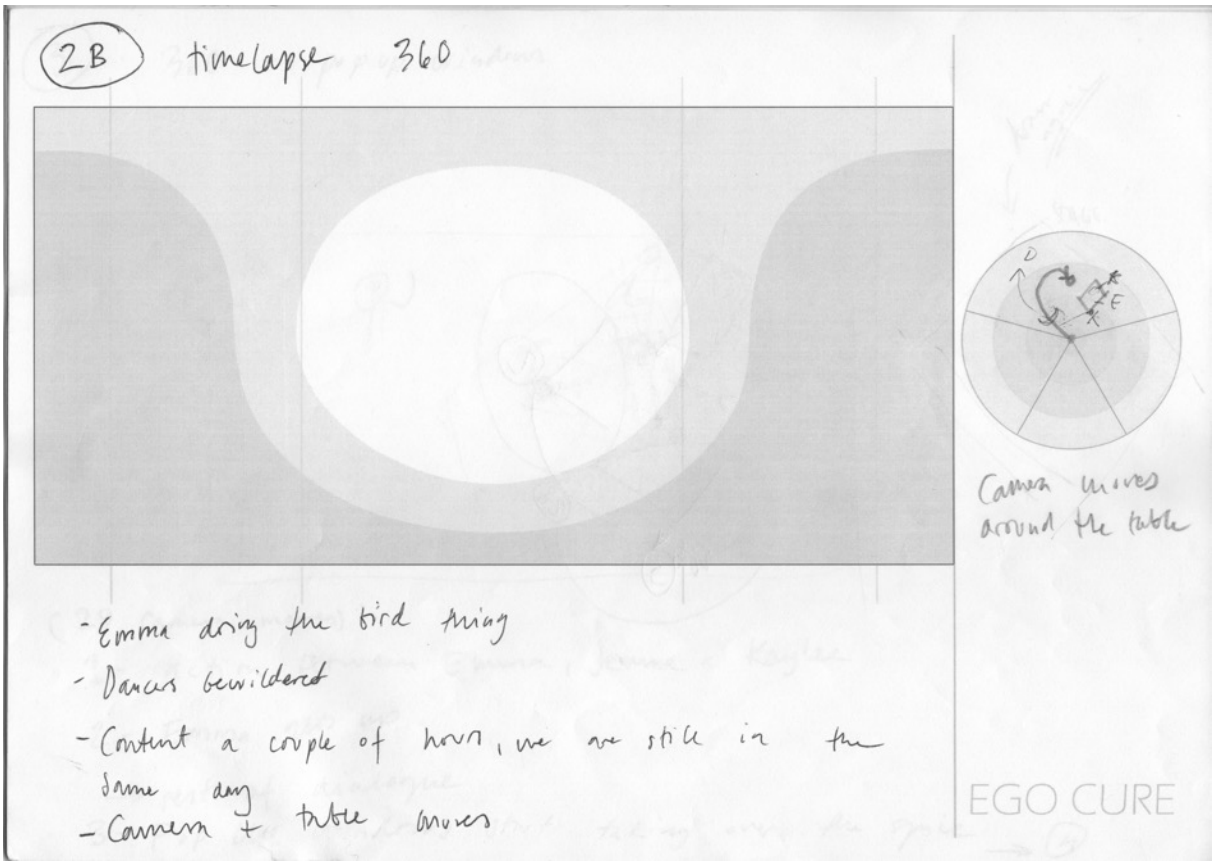
- Room seems a little small. Were keeping it that way to simulate the real location. Discuss possibility to change location if problem persists
- The eyeline is not natural feeling, is the average not applicable? (did not feel like a problem in scene 1)
- Height of the table seems low. It is however the height of most of the tables around us in ELO, so until we have a specific table from set design (discuss the need) were keeping it so.
- The time of darkness between scene 1 and scene 2 needs to be timed. With light fading out and lamp turning on, the rest of the transition is definitely leaning on audio (applause continuing? music? sky's the limit)

- Being in the middle of the room makes the symmetry feel unnatural and the room small. Well pull back a few metres and adjust the angle slightly to the left
- use “moculus” to look at the suggested scenes in order to minimize the render times
- render stills to check scenes, minimizes render time and gives immidiate access to to set up
- If the action is not exactly center stage it feels somehow more natural. It might also give the viewer (it gives me) the feeling of the freedom to look around and choose the narrative. We need the viewer to choose the narrative.

TRANSITION 2B

Description:
The space changes through a timelapse. People move around. The camera moves and turns to face the part of the room where the next scene with Jenna on the floor is going to take place.

Analysis notes:
- So we are actually eliminating the edit at this point, both the light going on and the timelapse+rotation is more a theatre approach.



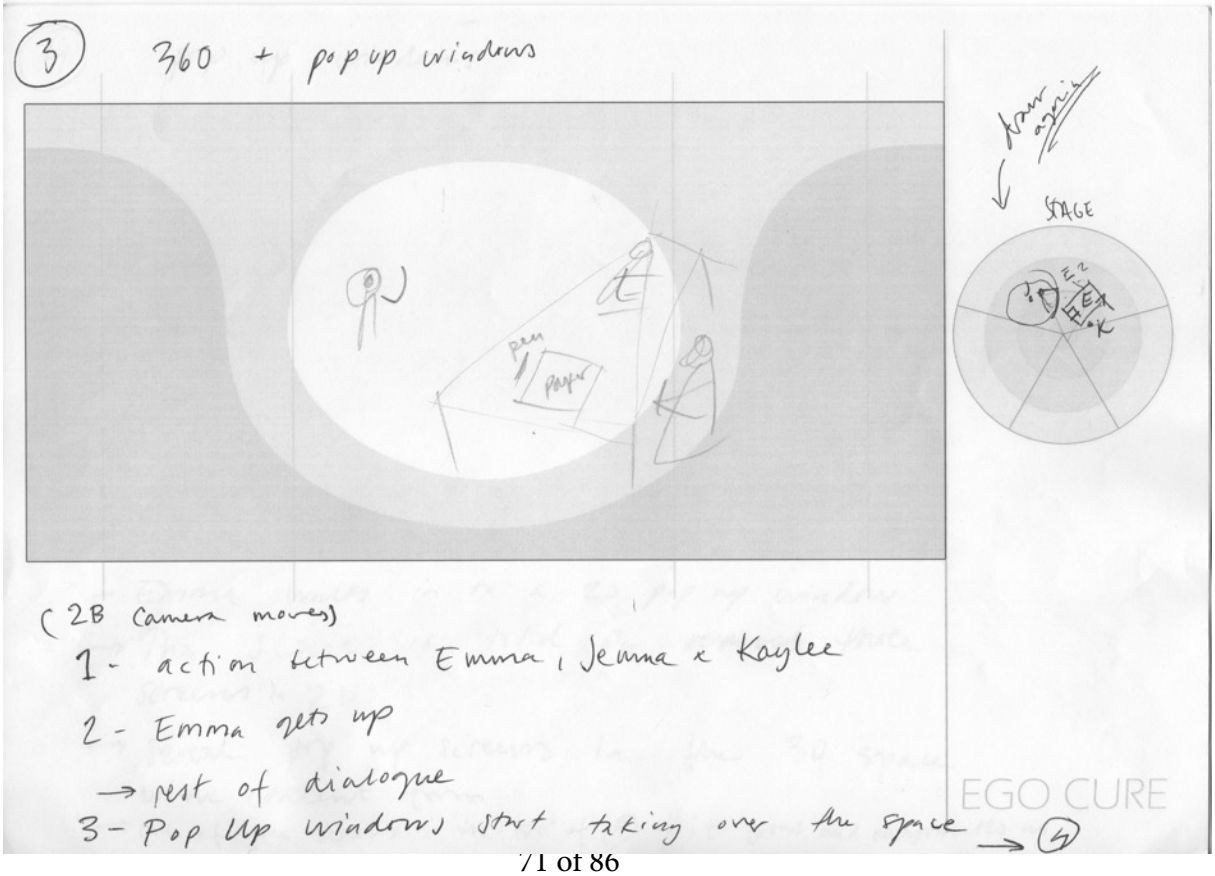
Questions and decisions during PREVIS:

- We decided to make a slight movement and loop it
- The characters move freely over to the curiosity zone and around the space
- How much time does the time lapse cover?
- How fast can the timelapse move in the 360 and still be interesting
- Is it a good idea to use timelapse, with the stitching being time consuming? Is it possible to speed up, edit jump cuts and then lastly stitch to save time?
- If the option of timelaps turns out to be too time consuming, let's go back a step and do edits.

-> testshoot a timelapse with the pixpro to test stitching and speed

SCENE 3

Description:
Dancers acting out a scene. Emma on the table and Kaylee next to it, trying to make sense out of all the notes.



Analysis notes:

- Almost classic theatre, the viewer only needs a moment to get used to the camera having moved location.
- Until, first one and then several pop up windows show the action as if the dancers were filming it with their cellphones.

Questions and decisions during PREVIS:

- The first pop up appears when one of the dancers starts filming from the corner.
- Two more pop up to establish that the content is more abstract and not from any specific source.
- If the film ends up being made in 2D the pop up windows appear on top of the film. If it is made in 3D the windows need to be placed into the 3D space.
- We are testing the 3D space option since we have that possibility.
- Three pop up windows within the scene before going over to scene 4 and letting them take over, might be enough
- should they grow a little?

Questions and decisions during PREVIS 2:

- We started by making the pop ups face us, somehow this felt weird (it might be because although we think about the VR space as 360, its actually a square room for our brains. Somehow we want to place objects as we would if it were reality)
- We turned the pop up windows to all face the same way, and it feels like it makes more sense.
- As we transition into scene 4 they can grow and move around if we still want to make more of a tunnel or spere. The hanging paintings style might look good for that too though.

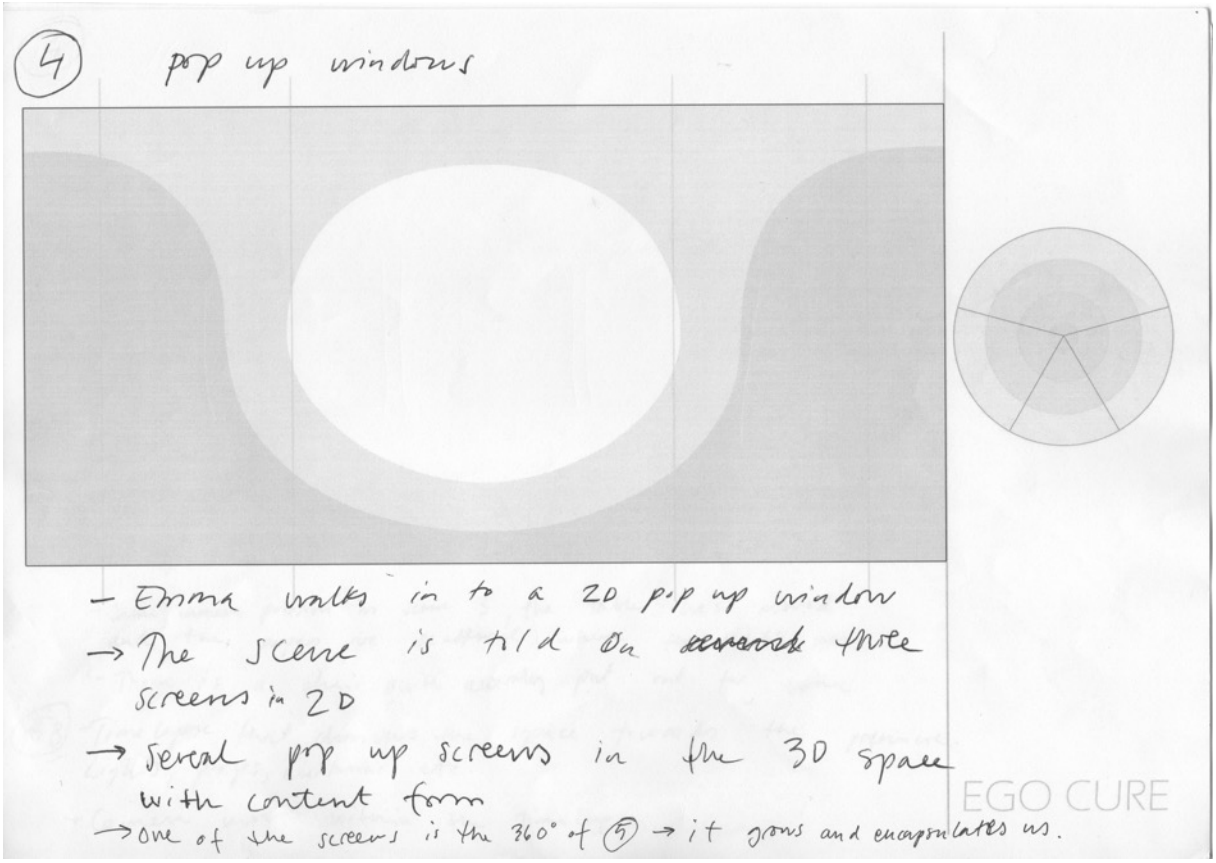
SCENE 4

Description:

Emma storms out of the studio and in to the kitchen to make a phone call to her friend Joshua

Analysis notes:

- Back to 16:9 2D.
- Were trying out a mosaic of different size screens, with different camera angles and image sizes.



Questions and decisions during PREVIS:

TRANSITION 4B

Description:

One of the screens in the 3D space is the room with the stage. It approaches us an envelopes us. Because the room moves in on us there is no camera movement within the transition.

Analysis notes:

Questions and decisions during PREVIS:

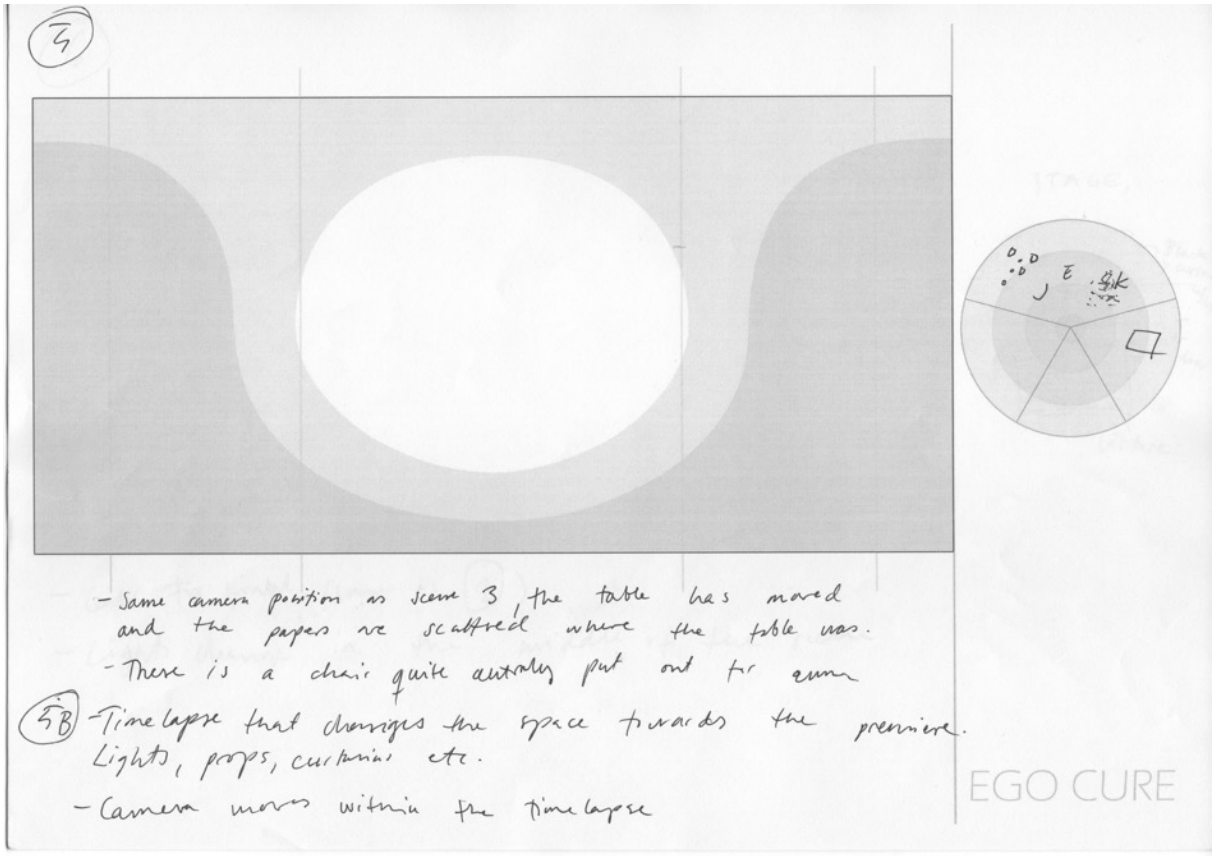
SCENE 5

Description:

The ensemble reenacts scenes of Emmas manuscript for her under Kaylees supervision, until it's evident that it's not working and Kaylee runs of f with a phone call

Analysis notes:

- Camera angle is facing the door (as in scene 3)



Questions and decisions during PREVIS:

TRANSITION 5B

Description:

The audience seats and stairs are being built. The stage i being set for the premiere

Analysis notes:

- Camera movement and timelapse
- We are basically laying the ground for camera movement within the scene to come

Questions and decisions during PREVIS:

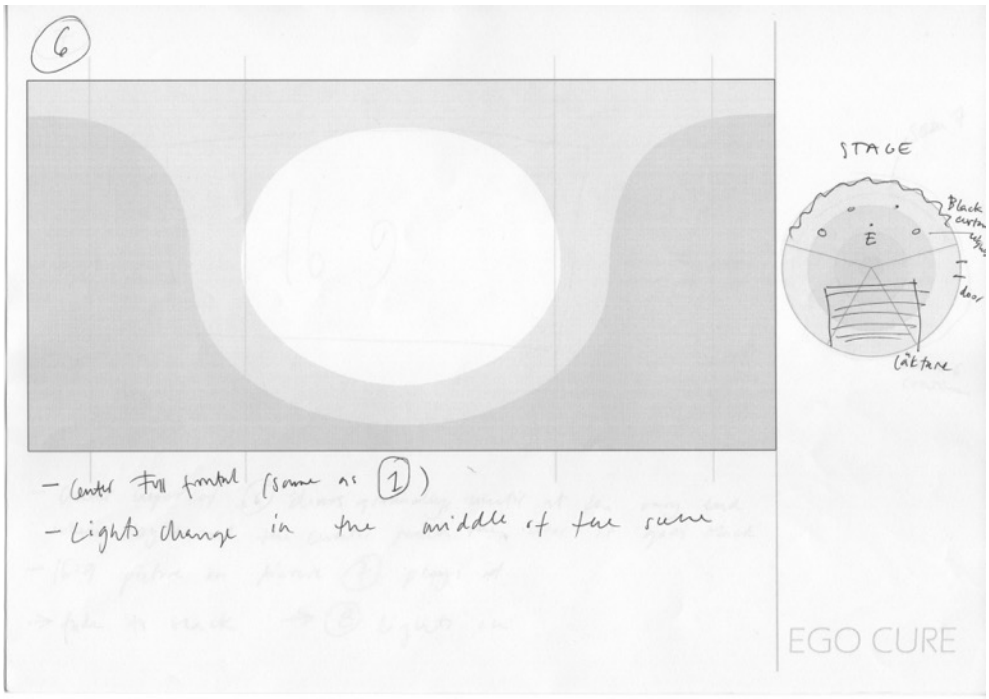
SCENE 6.

Description:

Emma and the dancers improvise a mad performance.

Analysis notes:

- The viewer is pulled in to the madness by moving camera (if technically possible, depending on set up chosen in the end). It's not a huge crazy movement, more like a slow controlled and stable participation in the dance. Go slow and careful
- Three levels of movement; first a slow camera run, then an element of choreography that is revealed by us moving through the dancers (see reference Pina video) and lastly the dancers bodies moving our position (like a contact impro, but no eye contact at this point)
- If contact is very deliberate and planned, perhaps it saves the interactive element for Emma for later on.

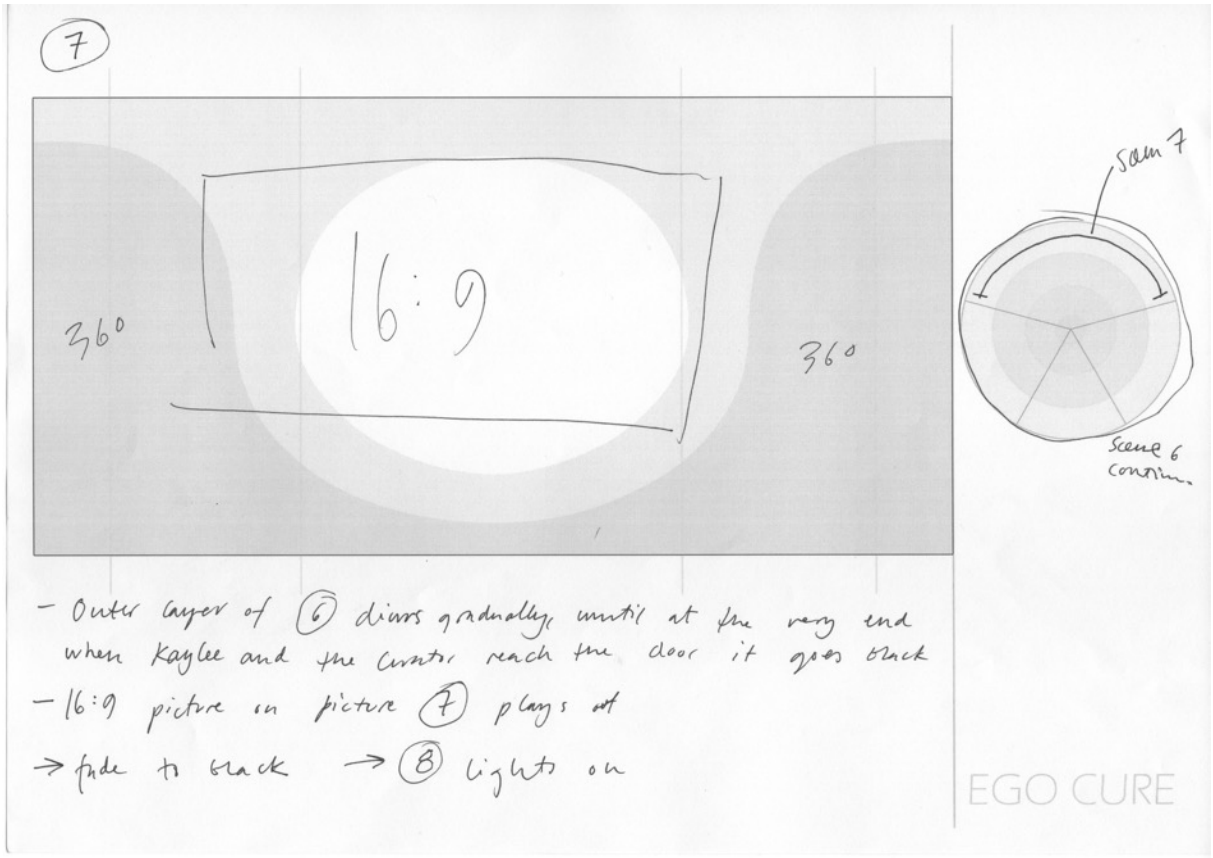


Questions and decisions during PREVIS:

SCENE 7

Description:
Kaylee and the Curator walk through the lobby towards the studio

Analysis notes:
Edited, same feeling as 4, 16:9 picture in picture. The background is a continuation of scene 6, that slowly fades to black. Ends with cut to black, that cuts to lights on in the 360° studio.



Questions and decisions during PREVIS:

- When will the fading to black start? We want to keep the picture in picture effect as long as possible, but there needs to be a dark moment long enough for the set up in scene 6 to change enough for the full effect of the lights going on.

(SCENE 7B)

Description:
Kaylee turns the lights on in the studio. The lights going on turns the black space (that we faded to) into the 360 studio.

Questions and decisions during PREVIS:

SCENE 8

Description:

Analysis notes:
- To emphasise the pressured atmosphere, the ultimatum of the curator and the act of violation witnessed by so many bystanders, this scene uses edits. It means the camera cuts from location to location within the room.

Edits, camera angles:

Camera 1 - Lights go on to reveal overview of the room. E&J to the left, K&C to the right. K still with her finger on the light switch. Cut when K and C start walking across the room.

Camera 2 - Close up of E. K enters the shot. C sits down in the curiosity zone. Cut to new overview.
-> Q Should we cut to the same angle as 1? Can we cross the line of the 180 degree rule in VR? What is the rule of 180 degree in VR? rule of 360 degrees?

Camera 3 - On the line cut, we cut out to a super wide shot in the same line, so straight behind camera 2. To our right very close is the action of J and the camera team, in front of us E&K, to our left C

- Shooting over the camera team in this shot emphasis the pressure on the cast of having to think about what they say in front of the curator and the camera team.

Camera 4 - Curator. Gets up and walks towards the camera. Just as he reaches it we cut.

Camera 5 - Super close up of Emma, she backs towards towards the door to our right.

Camera 5B - Curator walks in to the shot, Emma keeps going to the door to our right only to find it locked. Curator calmly sets up his suitcase and mask while the dialogue continues. Curator starts walking towards E and we cut.

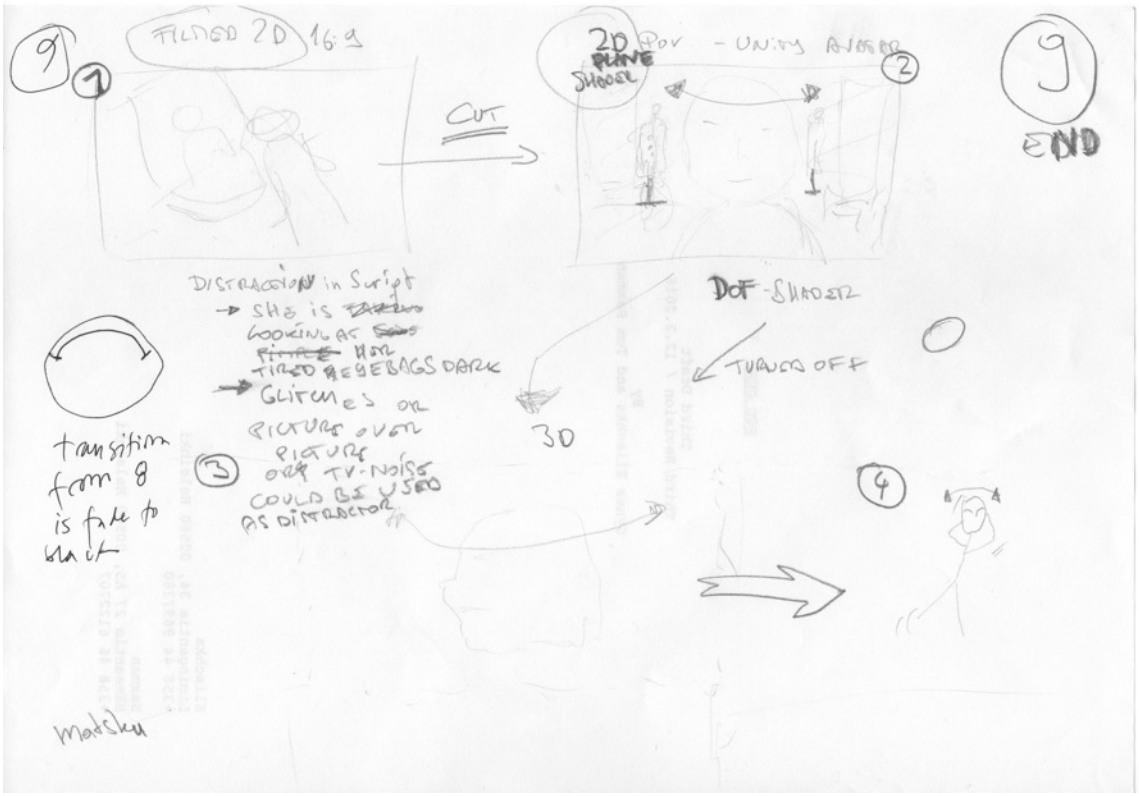
Camera 6 - Dolly shot/ tracking shot. Slowly pulls in towards the E raising her fists and the dialogue. By the time C places the mask its a OTS. Fade to black.

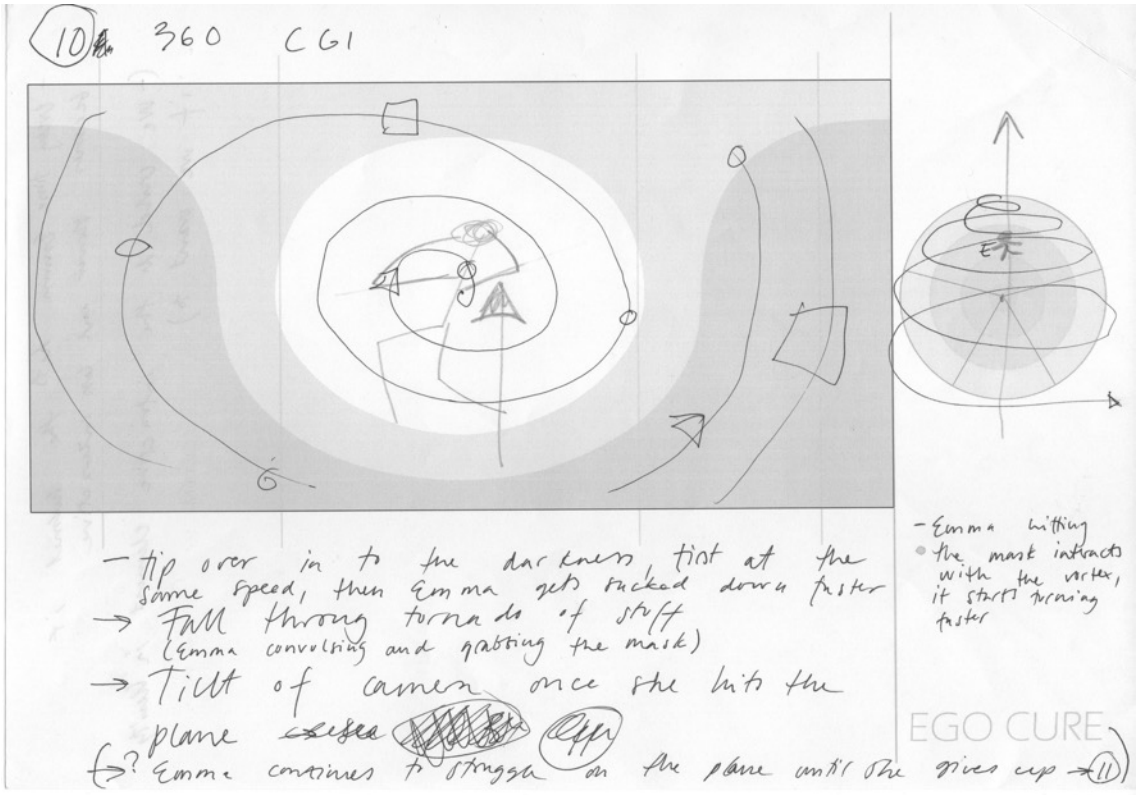
Questions and decisions during PREVIS:

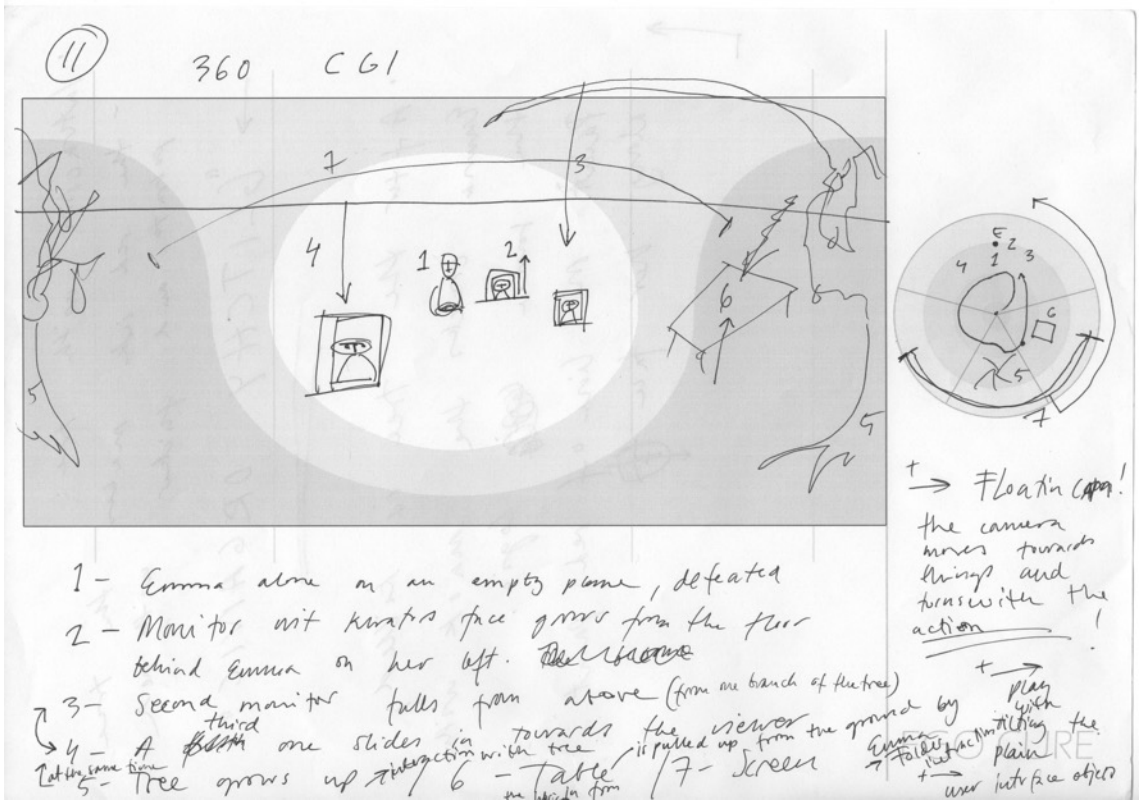
The previs for this scene is analysed fully in the next part of the text.

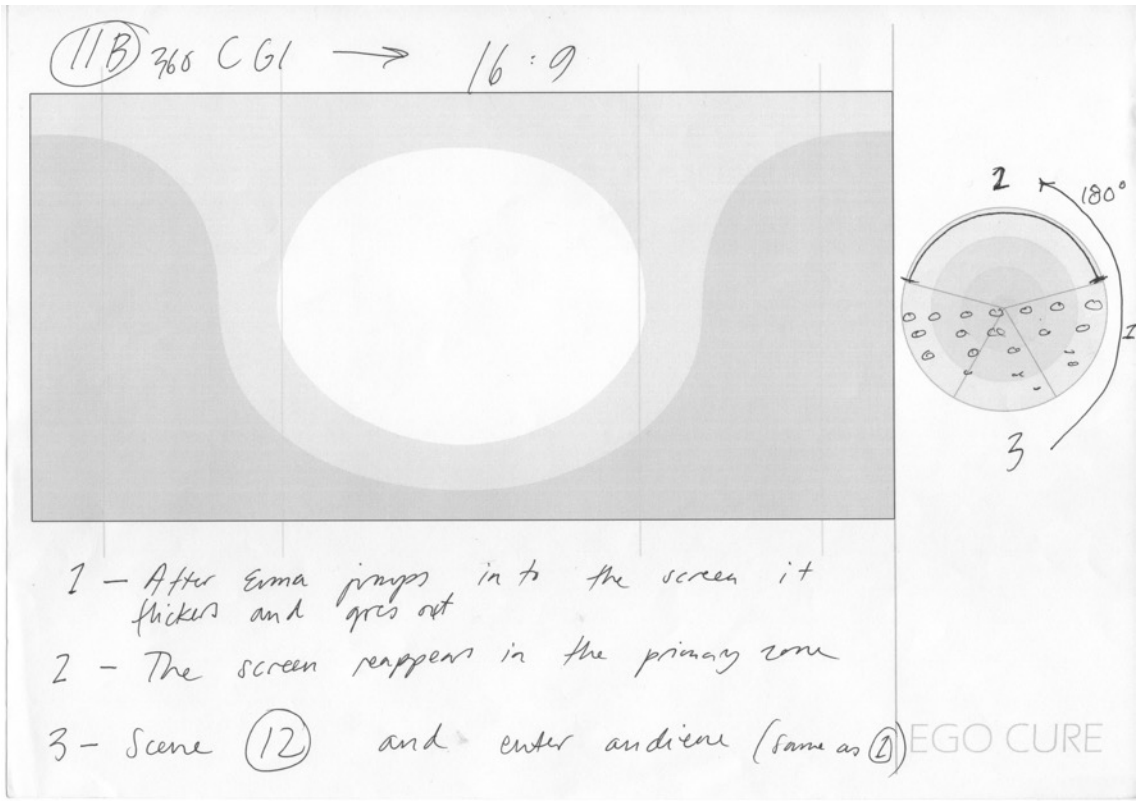
SCENE 9 - 11

Since theses scenes are motion-capture and animation in the final film, they are pre-visualised in 360° video. The 360° video previs is done by a team with the director and the actors. The previs animated in Maya is for the purpose of testing the scenes that are to be filmed with
actors, to solve problems that might arise before they arise on set (see more of previs goals below)


9
FILMED 2D 16:9
CUT
2D PLANE SHADER
2D POV - UNITY ADDED
9
END
DISTRACTION in Script
→ SHE is FARING LOOKING AT FACE HAIR TIRED EYEBAGS DARK
→ GLITCHES ON PICTURE OVER PICTURE ORR TV-NOISE COULD BE USED AS DISTRACTOR
3
transition from 8 is fade to black
3D
DOF-SHADER
TURNED OFF
4
Marsha


10 360 CGI
6
EX
- tip over in to the darkness, first at the same speed, then Emma gets sucked down faster
→ Fall throug tornado of stuff (Emma convulsing and grabbing the mask)
→ Tilt of camera once she hits the plane
↳? Emma continues to struggle on the plane until she gives up → 11
- Emma hitting the mask interacts with the vortex, it starts turning faster
EGO CURE


11
360 CGI
1 – Emma alone in an empty room, defeated
2 – Monitor unit rotates face grows from the floor behind Emma on her left.
3 – Second monitor falls from above (from one branch of the tree)
4 – A third one slides in towards the viewer
5 – Tree grows up
6 – Table
7 – Screen
Floating camera!
the camera moves towards things and turns with the action
play with Emma to distract/mislead the plain user interface objects


11B 360 CGI → 16:9
1 – After Emma jumps in to the screen it flickers and goes out
2 – The screen reappears in the primary zone
3 – Scene 12 and enter audience (same as 4)
180°

Appendix 3: List of Actions

PREVIS list of actions

SCENE 1 cinema

- 16:9 screen goes on, film plays
- at the applause an audience appears around the viewer
- fade to black

SCENE 2 studio

- In the darkness a light goes on
- Emma gets up and stands next to the table
- Kaylee enters the door
- Kaylee turns the lights on
- Kaylee walks over to the table
- Emma leads Kaylee to the left of the viewer
- (they sit down to leaf through the folder on the floor)
- (Kaylee paces while typing on the phone)

TRANSITION 2B studio

- timelapse of dancers practising and some of the things in the space moving around
- camera turns to the next position

SCENE 3 studio

- Jenna is on the floor on her back, dancers around her looking at her. Kaylee sits next to the table. Emma on top of the table
- The dancers stop and go to stretch at the stage area
- (Emma strikes out parts of the scripts with the red ballpoint pen)
- (Dancers start to prepare for the next scene, putting pipes on their legs)
- (Emma throws crumbled paper on the floor, Kaylee picks it up)
- Pop up windows start appearing in the space. They show the action in 2D from other camera angles, as filmed with cellphone cameras.
- Emma storms out of the door

SCENE 4 Pop up window circle/sphere/tunnel 2D

- (Emma moves from one window to the next as the scene plays out in them)
- (Different screens show different angles)

TRANSITION 4B

- One of the pop up windows expand into the 360 view

SCENE 5 studio

- Emma walks into the room. Dancers scatterd on the floor (on their phones). Kaylee by the table.
- Emma sits down on a chair on a central spot in the room
- Dancers reenact the scenes Kaylee reads
- Kaylee anders phone and rushes off

TRANSITION 5B studio
- The elements of the stage and the chairs for the audience are being built
- Dancers mov around in the space
- Camera moves smoothly around within the timelapse

SCENE 6 studio

- Stagehands continue preparing the space
- Jenna talks to Emma by the stage
- The dancers and Emma and Jenna start dancing, the movement gets more and more hectic
- The camera starts to smoothly move around and is engaged in the dance by the dancers
- Scene 7 appears as a picture in picture

SCENE 7 studio + lobby

- Scene 6 continues playing out in the background. It grows gradually more soundless and more dim until at the very end its completely gone
- 16:9 overlay of scene 7
- scene 7 plays in 16:9 up until Kaylee reaches the door and opens in, at this point the actison continues in the 360 and the 16:9 disappears.

SCENE 8 studio

Camera 1 (same position as end of 6/7) :
- Kaylee turns the lights on
- Kaylee walks to center stage, Curator walks to front row of chairs. Cut as they walk.

Camera 2:
- Kaylee and Emma center stage. Dancers disperce.

Camera 3:
- Jenna is washing her face by the sink
- Emma kicks bucket

Camera 4:
- Curator gets up and walks towards the stage

Camera 5:
- Emma runs for the exit. Can't get out
- Curator by the table (takes out mask)

Camera 6:
- The curator walks over to Emma (and places the mask)

SCENE 9 bathroom

- Emma washes her face by the sink
- Emma looks in the mirror

-> mocap (previs made by autopano with actress)

SCENE 10 ego cure world

- mocap

SCENE 11 ego cure world

- mocap

SCENE 12 Cinema / theatre

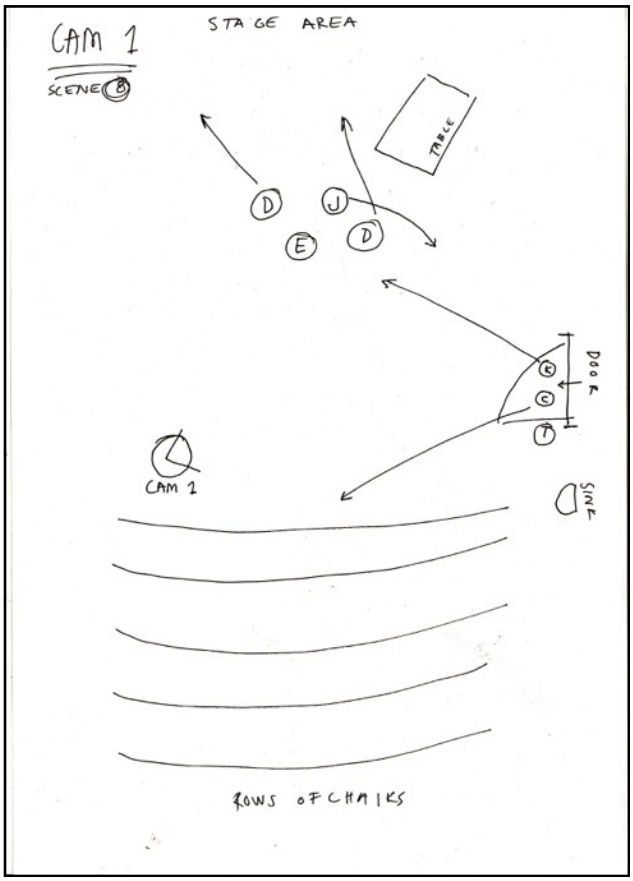
- Same as scene 1

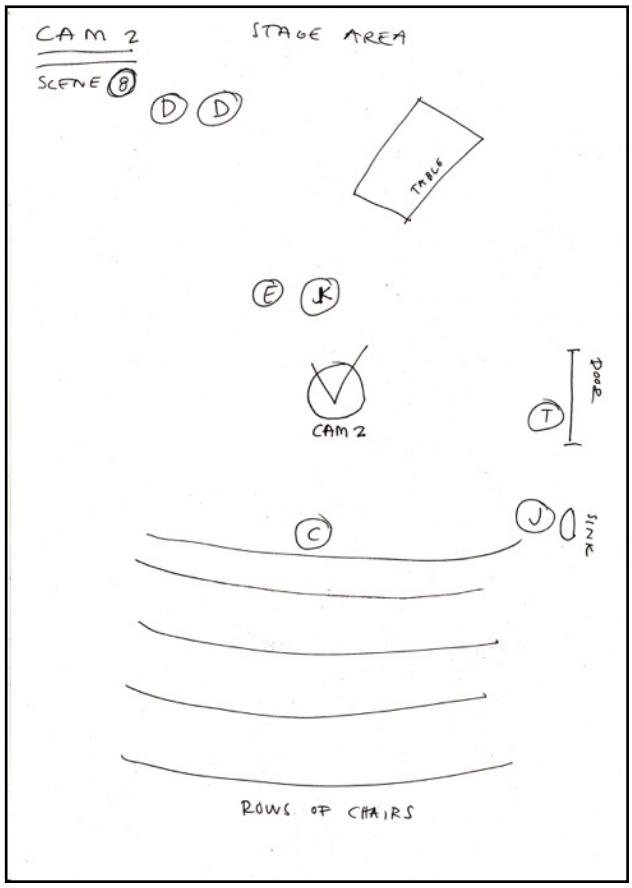
Appendix 4.

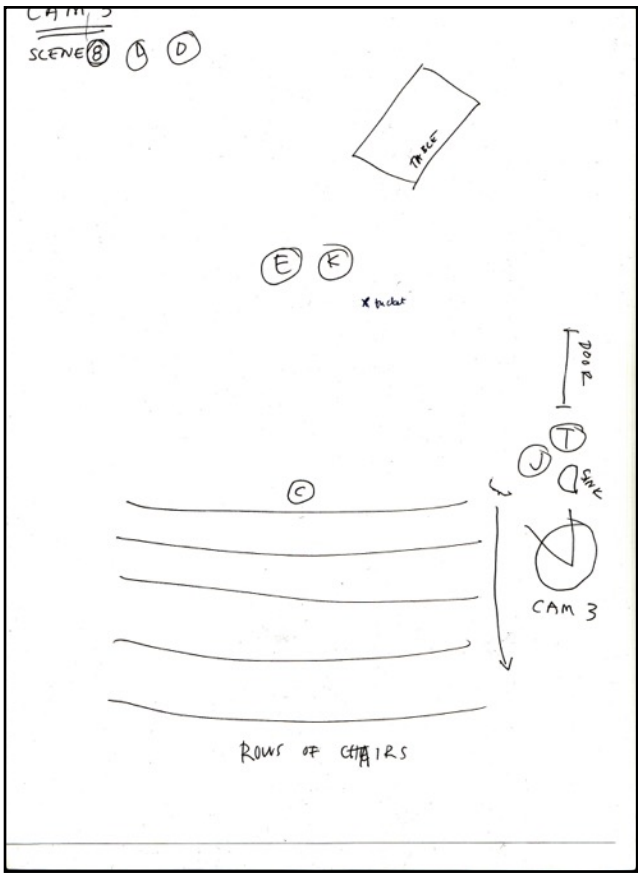
The previs can be accessed through the following link: https://drive.google.com/folderview?id=0B-NlbXnJEcA0Ym5pZVc4YXd2Tjg&usp=drive_web

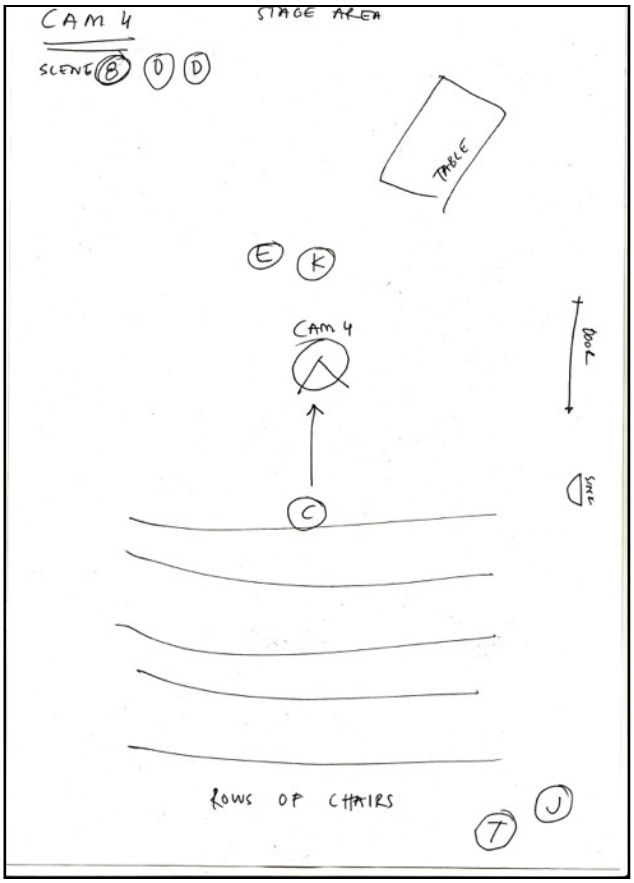
This version of the previs is in equirectangular form but will be available upon request as 360 video

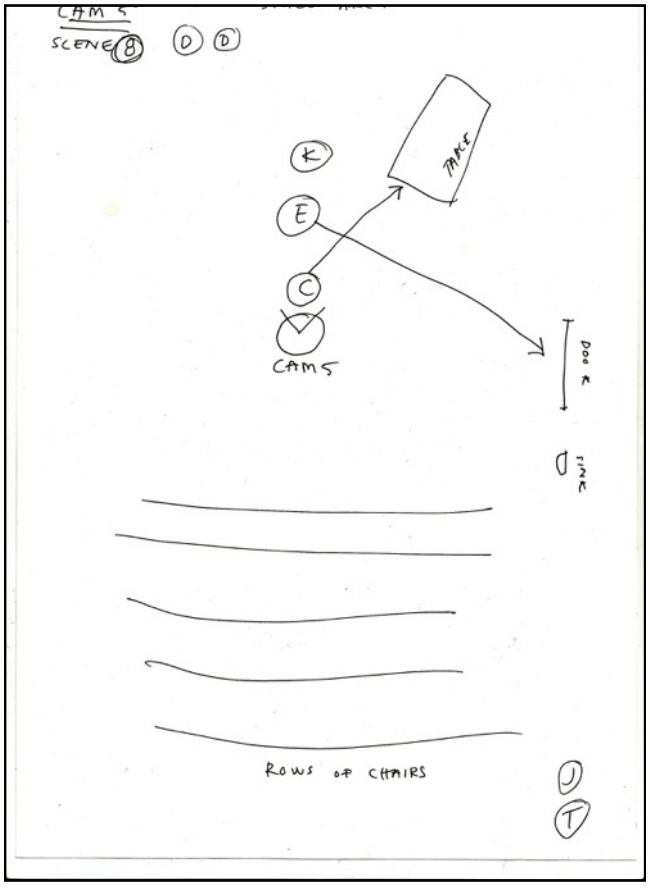
Appendix 5: Storyboard of Scene 8

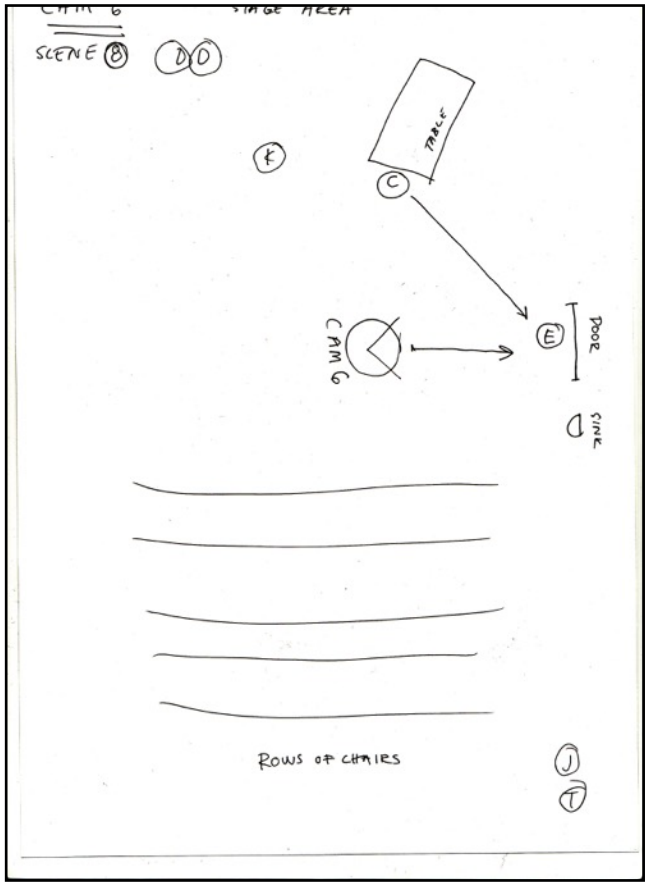









CAM 5
SCENE 8
D D
K
E
C
TABLE
CAM 5
DOOR
SINK
ROWS OF CHAIRS
J
T


SCENE 8
D D
K
C
TABLE
CAM 6
E
DOOR
SINK
ROWS OF CHAIRS
J
T

Appendix 6:

“EgoCure” Official production package + team info, written by director, can be found behind this link:

https://drive.google.com/open?id=0B8sUsrsOCacVYVZoZnRrZFJLVUE